

# The Iron Age

A Review of the Hardware, Iron and Metal Trades.

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## Casting an Anvil Bed.

The proper design, construction and erection of an anvil-bed is a subject deserving the most careful attention of the ironworker, and depends to great extent both upon the character of the material to be operated upon and the size and weight of the ram to whose blows it is subjected. It is a popular error to suppose that the principal office of the bed is to gradually diminish the force of the blow, but since it is an unyielding mass, the molecules of which are in intimate connec-

tion, it will be readily seen that this is not the case. It has been observed that both excessive and insufficient weights of anvil beds produce evil results. If the bed is not heavy enough the foundation suffers considerably and is rapidly destroyed, unless proper remedies are resorted to before appreciable damage has been done. If, on the other hand, the bed is too heavy, the blow of the ram causes the latter to rebound, and may result in a broken cylinder head or piston, or a general destructive influence on the different moving parts. An example was recorded in a German establishment where the piston of a hammer of average weight completely fractured the upper cylinder cover, resulting in serious damage. It has often been said that the foundation should possess a certain degree of elasticity, but there seems to be no reason to warrant this assertion, since an elastic foundation would very probably require an unnecessarily large amount of work to be performed on a mass of metal in order to produce a desired result. There is, however, a considerable diversity of opinion in regard to this point, and under the existing circumstances it is perhaps difficult to advance any perfectly correct statement.

Within late years elasticity in this direction has been deemed unnecessary, and perfectly rigid foundations are, as a rule, adopted. The anvil-bed, which is generally made of cast iron, steel being employed in some cases, may be cast in several parts, which are afterward firmly bolted together; if, however, the bed is not excessively heavy, and if all required facilities for transportation are available, the bed may be cast in one piece, thus avoiding the difficulties resulting from imperfect joints. These joints, if indispensable, should be very accurately made in order to insure a perfectly uniform distribution of the effects of the blows. The masonry now most generally employed in constructing the foundations consists of brick laid in cement, and the cross section gradually diminishes toward the top. Great care should be exercised in insuring thoroughness in this part of the work, as the stability of the entire structure depends upon its proper execution. As previously stated, the construction of the anvil-bed may be effected in two ways—namely, by riveting the several parts after having been cast, and by casting

the bed in one piece. The latter method is much to be preferred to the former, for various and obvious reasons, and in adopting it the bed is cast directly above the foundation in an inverted position. After having cooled the casting and removed the mold, the former is turned into its natural position on trunnions supported by suitable timber framing, and though this operation may appear somewhat difficult to perform, it can be safely and speedily effected. In constructing the bed, three separate subjects are to be considered: 1, the mold; 2, the

cast iron, we have for its weight the following:

$$W = 6H + 8G.$$

If steel is to be employed as the material for construction, we have

$$W = 6H + 12G.$$

These formulae are, however, applicable only in the case of drop hammers, while for such in which steam is admitted above the piston they should be

$$W = 6H + 10 \text{ to } 12G \text{ (for iron bed),}$$

$$W = 6H + 13 \text{ to } 15G \text{ (for steel bed).}$$

The mold should be placed directly over the

direct communication with the gates through which the molten metal enters, are provided for the trunnions. The mold is dried by maintaining a light fire in its interior. It may happen that the iron which enters through the gate becomes chilled and closes the channel, and in this case the metal may be introduced through the open top of the mold. The latter should be firmly secured to prevent any change of position, and the corners are furnished with angle irons which guard against distortion. The necessary supply of iron is drawn from a

be commenced at the top. If the lower portion of the mold is removed first, the stability of the whole structure is seriously impaired, and a certain inclination to either side will inevitably take place. This would present considerable difficulties to all further operations, and may, in fact, result in a complete failure of the whole work. After the greater part of the mold has been removed, so as to expose the trunnions, a substantial timber framing, shown in Fig. 5, is erected, being intended as a support for the casting. The timber employed should

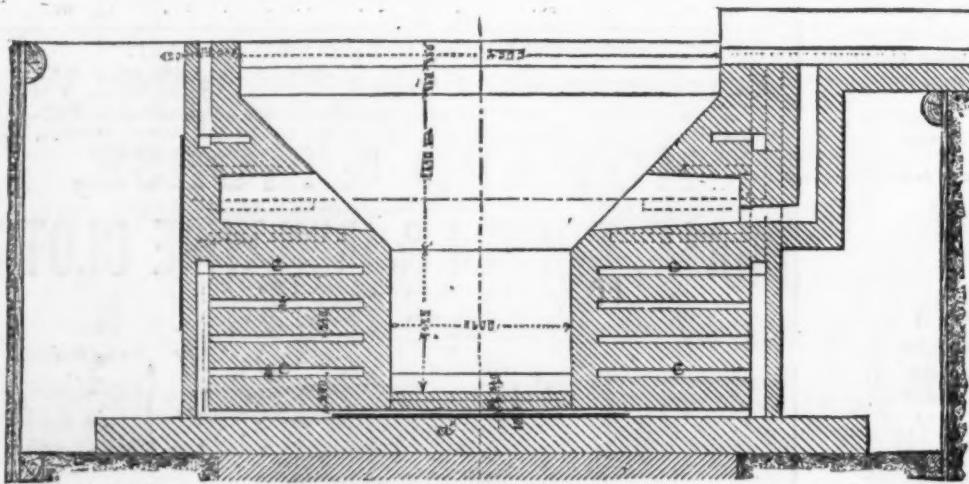


Fig. 1.—Longitudinal Section of the Mold.

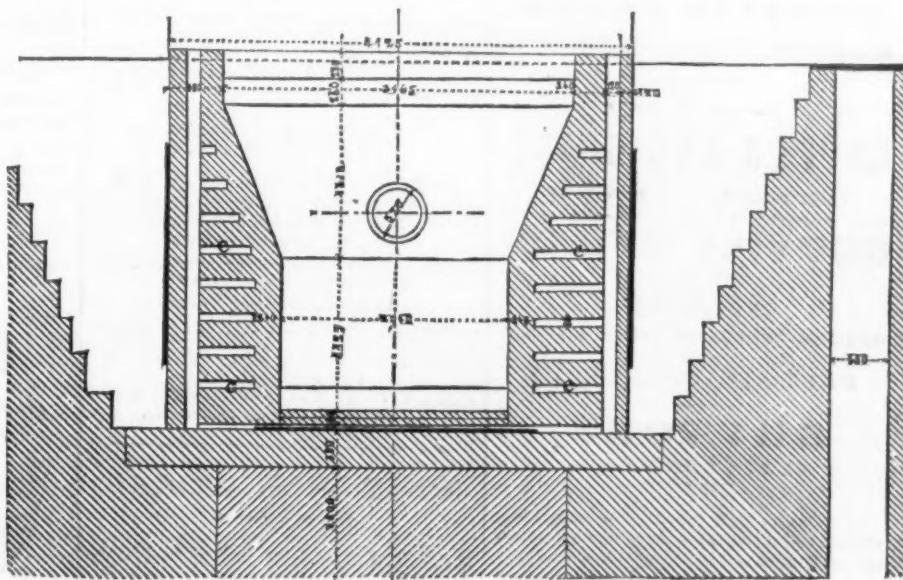


Fig. 2.—Cross Section of the Mold.

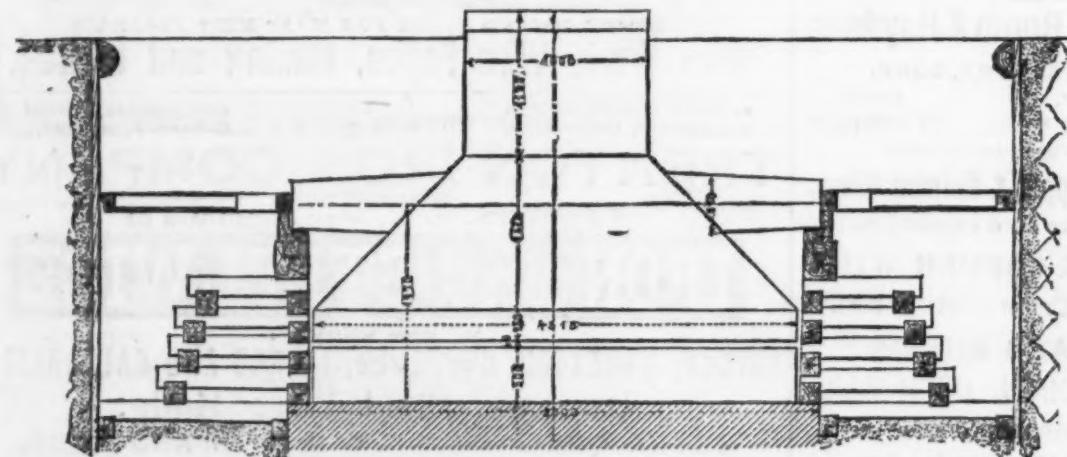


Fig. 3.—Longitudinal Section Showing Anvil Bed in Proper Position.

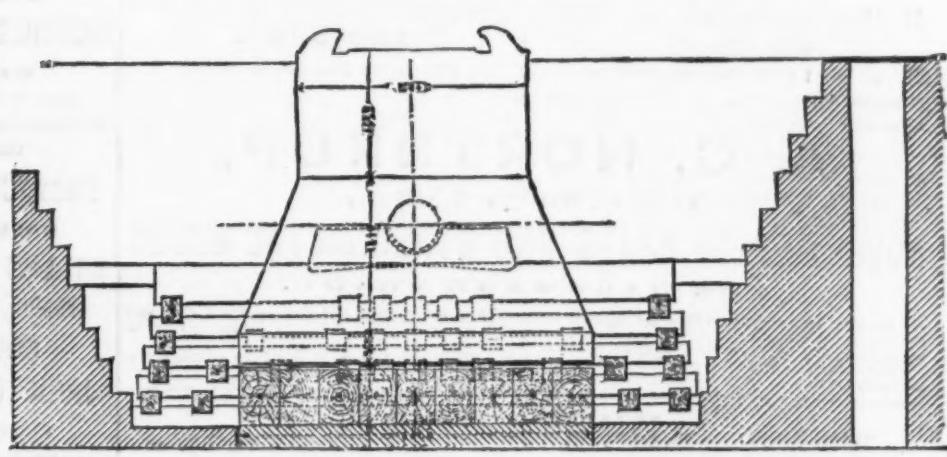


Fig. 4.—Cross Section Showing the Bearings of the Trunnions and the Frame.

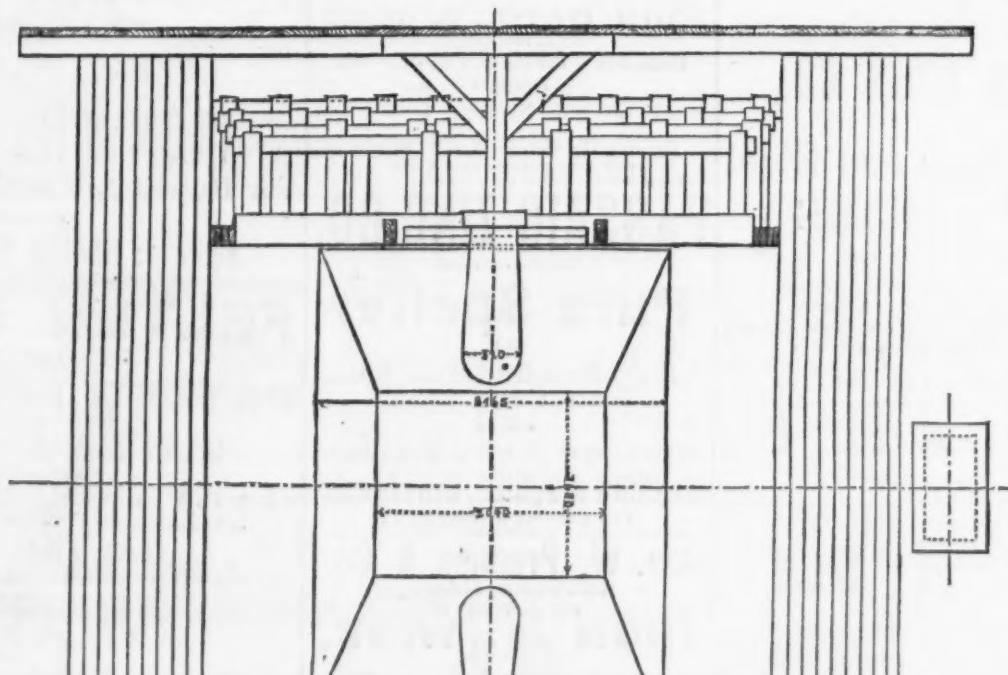


Fig. 5.—Plan of Timber Frame.

## CASTING AND ERECTION OF AN ANVIL BED.

casting operation; 3, the proper mounting of the bed. In order to illustrate the method of proceeding, we will here take as an example the case of an anvil-bed weighing about 150 tons, the weight of the ram being somewhat over 12 tons. It may be well, in this connection, to give a few simple formulae for the calculation of the approximate weights of the beds for hammers of different dimensions. If we designate the weight of the bed by  $W$ , the weight of the hammer by  $G$ , and the length of stroke by  $H$ , then, if the anvil-bed is to be made of

foundation and the latter provided with a fire-proof covering, above which air spaces are arranged so as to facilitate the escape of the gases. The bed is cast in an inverted position in order to obtain a homogeneous mass of metal, all impurities and air bubbles rising to the surface where they may be readily removed. In the case here considered, the lowest air space contains a cast-iron plate,  $a$ , about  $1\frac{1}{2}$  inches thick (shown in Figs. 1, 2 and 7), which supports the cores for the upper part of the bed. The mold is constructed of fire-brick, and suitable spaces,

cupola, temporarily erected near the mold, although if the necessary means of transportation are at hand, ladies may be filled in the foundry and carried to the point where required. It will thus be seen that the operation of casting presents no special difficulties. (For Figs. 6 and 7 see p. 9.)

The last and undoubtedly most difficult part of the work is the turning and proper erection of the bed. After allowing a reasonable length of time for the cooling of the casting the mold is removed, and it should here be stated that this work should

be sound, without cracks or other defects, since it is subjected to considerable strain in the subsequent operation. The trunnions revolve in bearings shown in Fig. 6 (p. 9), the lubricant employed being soap, and in order to insure perfect rigidity and strength it is essential that the greatest possible care be taken to properly secure the several parts. The remaining portion of the mold is then gradually and carefully removed, and all precautions adopted to effect a successful turning of the bed, which is greatly facilitated by so arranging the supports that the center of gravity is slightly above the bearings. Before finally placing the anvil-bed in its permanent position, the foundation is provided with a layer of wood and the bed is slowly lowered by gradually removing the supports. The timber framing is preserved, and may be successfully employed in carrying out other work of a similar nature. Our accompanying engravings are admirably adapted to give a clear idea of the arrangement of the mold, casting and supports, and will undoubtedly be found as acceptable as any further explanatory remarks.

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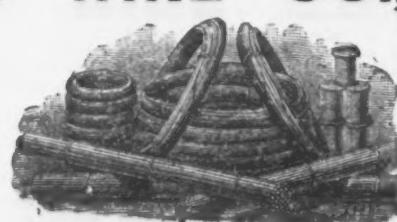
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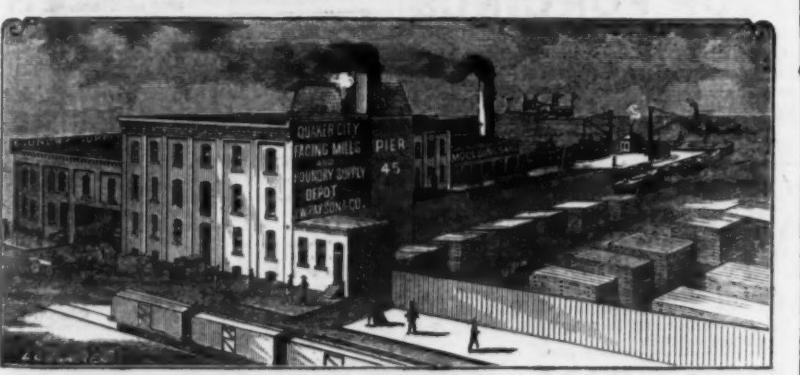
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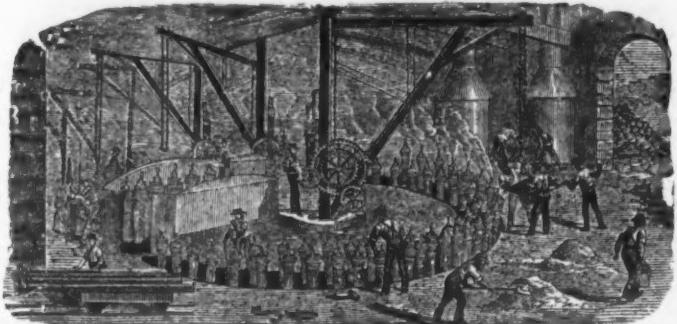
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The cheapest and most  
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Catalogues and Price  
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Manufacturers of  
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**CORRUGATED AND CRIMPED IRON  
ROOFING & SIDING,**  
Iron Buildings, Roofs,  
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**NATIONAL HARDWARE & MALLEABLE IRON WORKS,**

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**MALLEABLE, FINE GRAY IRON AND STEEL CASTINGS** made from patterns to order. Special attention given to Tinning, Bronzing, Coppering, Japanning and Fitting. A large line of Carriage and Wagon Castings constantly on hand for the trade.

**BRIDGEWATER IRON CO.,** Bridgewater, Mass.

Manufacturers of

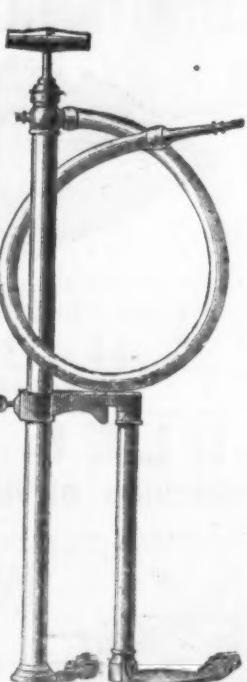
**SEAMLESS DRAWN BRASS & COPPER TUBES,**

BRIDGEWATER HORSE NAILS, 3d. FINE NAILS,

Tack Plates and Forgings of Every Description.

**NAHUM STETSON, Jr., Agent, 73 Pearl Street, New York.**

T. J. ALEXANDER, Manager  
BOSTON, MASS.



The above cuts (Fig. 229) represent our **PATENT AQUAPULT**, so valuable a Hand Force Pump that certain competitors have made bold to infringe on same, and even to resort to the crime of plagiarism in using our cuts and trade-mark name of article to decoy customers away from our manufacture and invention; and we caution the trade and customers against purchasing this article when not made by ourselves, as we intend to protect our rights under our patent.

**WE ARE THE ORIGINAL AND FIRST INVENTORS OF THIS STYLE OF PUMP, AND HOLD VALID LETTERS PATENT ON SAME, AND ANY STATEMENT THAT IT HAD BEEN IN THE MARKET PREVIOUS TO OUR MANUFACTURE OF SAME IS OF COURSE ABSURD AND WITHOUT THE SLIGHTEST FOUNDATION IN TRUTH.**

**W. & B. DOUGLAS, Middletown, Conn.**  
BRANCH WAREHOUSES:  
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Sole Manufacturers of



### SKINNER'S PATENT COMBINATION CHUCK.

Universal, Independent and Eccentric.

By slitting a stud on the back of chuck it is instantly changed from Universal to Independent, and vice versa. Each Chuck is guaranteed perfect. All parts are made interchangeable. Only the very best materials used in their construction. Reverse or special jaws furnished when desired.

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Plain and Ornamental Butts,

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Wooden Well Curbs, Wood Tubing,

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Write us for prices.

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Received Award Atlanta Exposition.

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1. It is cheaper.
2. It casts no shade.
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14. It is the only fence that will keep stock off railroads.
15. It is the only fence that can be made "hog tight, horse high and bull strong."
16. It will protect orchards from boys, and water-melon patches from older depredators.

STAUFFER, MACREADY & CO., New Orleans, La.

CARLIN & FULTON, Baltimore, Md.

Send for Circular.

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**NATIONAL HARDWARE & MALLEABLE IRON WORKS,**

Lehigh Avenue, American and Third Streets, Philadelphia.

**THOMAS DEVLIN & CO..**

**MALLEABLE, FINE GRAY IRON AND STEEL CASTINGS** made from patterns to order. Special attention given to Tinning, Bronzing, Coppering, Japanning and Fitting. A large line of Carriage and Wagon Castings constantly on hand for the trade.

**BRIDGEWATER IRON CO.,** Bridgewater, Mass.

Manufacturers of

**SEAMLESS DRAWN BRASS & COPPER TUBES,**

BRIDGEWATER HORSE NAILS, 3d. FINE NAILS,

Tack Plates and Forgings of Every Description.

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# WIRE NAILS, TACKS, SHOE NAILS,

And Every Variety of Small Nails.

Offices &amp; Factories at Taunton, Mass.

Warehouse at 78 Chambers St., New York,

where may be found a full assortment of Tacks, Brads, Wire Nails, &amp;c., for the accommodation of the New York Wholesale and Jobbing Trade.

Any variations from the regular size or shape of the above-named goods made from sample to order.

A SILVER MEDAL has been awarded above goods at the Paris Exposition, being the only medal awarded any American manufacturer of Tacks and Wire Nails.

# DUC'S PREMIUM ELEVATOR BUCKET.

ALWAYS FIRST  
COMPETITIVEPREMIUM IN  
TESTS.

The Storehouse Bucket, in sizes from 12 to 17 inches.

This Bucket is struck out from the best charcoal iron; consequently is very durable. It requires 50 per cent less power to run it than the old-fashioned square bucket, and will outwear half a dozen of them. Over 200,000 are now in use by the principal Millers, Brewers, Maltsters and Manufacturers at home and abroad. It is the best Bucket made.

**CAUTION.**—The popularity of the **DUC BUCKET** has caused many manufacturers of the old style of Elevator Bucket to closely imitate its spherical shape. We warn all parties against patronizing infringers of our patents, as they will be held accountable. Send for circular. Address

T. F. ROWLAND, Sole Manufacturer, Continental Works, BROOKLYN, N. Y.



## OLD COLONY RIVET CO., Kingston, Mass.

(Established 1866.)

Manufacturers of NORWAY IRON RIVETS of Superior quality.

We carry a large stock of the various sizes of *Tinners', Carriage, Wagon, Hame, Belt, Barrel, Safe and Tank Rivets*, and make promptly to order all sizes not larger than 7-16 inch diameter. We have a capacity of two tons of the various sizes of small Rivets per day of ten hours. Freight allowed to all points on or east of the Mississippi River. Correspondence with buyers solicited.

WILLIAM H. DUNBAR, President.

HENRY HOBART, Treasurer.

JAMES L. HALL, General Agent and Manager.

We carry the most complete stock in the city with our New York agents, The American Tack Co., 115 Chambers St.



Send for Illustrated Price List.

John Chatillon & Sons,  
59, 61, 63 Cliff Street, New York.

ESTERBROOK'S  
STANDARD  
and  
RELIABLE

STEEL PENS  
FOR SALE  
BY ALL STATIONERS.

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## THE ANSONIA CORRUGATED STOVE PLATFORM,



With Patented O. G. Border.

ROUND ZINC.

27, 30, 32, 34, 36 inch.

Manufactured of heavy metal, requiring no nailing or lining; the edge retaining its form. Superior pattern, finish and quality. Price as low as any.

Send for List and Discounts.

Packed 12 in each case.

## PURE ELECTRIC WIRE,

Manufactured by the

## ANSONIA BRASS AND COPPER COMPANY,

For Magnets, Telegraphs, Telephones, &amp;c.

Insulated on the bare wire with H. Splitdorf's patented Liquid Insulation, covered with cotton or silk.

All sizes of Bare and Covered Wire in Stock.

The conductivity of every bundle tested and warranted.

## THE ANSONIA WROUGHT GONGS,

For Clocks, Indicators, Telephones, Call Bells, Bell Punches, Steamboat and Railroad Use. Burnished or Nickel Plated.

ANSONIA BRASS AND COPPER CO., 19 Cliff St., New York.

## ESSEX HORSE NAILS.

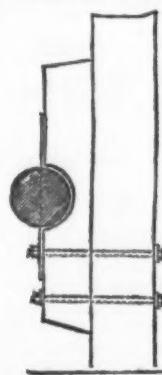
Hot Forged, from Norway Iron, Warranted Best Quality, Pointed and Polished.

HOWE &amp; CO., Troy, N. Y., Sole Agents.

entirely of granite. It may be of interest in this connection to state that a book, by Mr. E. P. Edwards, has just been published in England, entitled "The Eddystone Lighthouses," containing an abstract of Mr. Smeaton's own account of his work, besides giving all the particulars of construction of the old lighthouse, and embodying numerous facts of general interest.

### Pneumatic Clocks.

The unification of time is a subject of unquestionable interest and importance, and has offered a wide field for enterprise, which appears to have been successfully cultivated by two Austrian engineers, Messrs. Popp and Resch. The system proposed by them has already been adopted in Paris and Vienna, and it is understood that at the present time negotiations are pending to secure similar benefits for London. Their system is what is known as the pneumatic system, in which one single good clock is required, and at each station where the time is to be indicated only a very simple apparatus is necessary, which, moreover, requires no at-



Casting an Anvil Bed.—Fig. 6.—End View of Trunnion and Support. (For description see page 1.)

tention whatever. When once the system of pipes is laid down, the addition of almost any number of clocks makes no practical difference in the working, and it has been found in Paris that clocks may be supplied and maintained in private houses at a trifling cost. The system, when first introduced, was found to be subject to some slight defects, which, however, have since been removed, rendering the working satisfactory in every respect. Nearly 20 miles of main pipes are now laid in the sewers of Paris, and about 1000 houses, in which there are upward of 5000 pneumatic clocks, are actually connected with and receive time from the main works, 14 public clocks, with 33 dials, being fixed in the public thoroughfares of the several districts. At the main works, which are situated in the center of these districts, air is compressed by means of steam engines actuating air-compressing machines, and stored in reservoirs, at a pressure varying from 15 to 45 pounds to the square inch. The air so compressed and stored is led into distributing receivers, after passing through a pressure regulator. A periodic transfer or discharge of compressed air from the high-pressure receivers into the

clock and its duplicates, as well as the self-winding mechanism and motion of the slide-valve, &c., are all automatically controlled, so as to require a minimum amount of supervision, and anything abnormal occurring is instantly and automatically signalled. The piping actually laid down in Paris is at the center or point of departure divided into 10 distinct parts, radiating from the center and leading to various quarters. These 20 miles of main are composed of lead pipes, the inside diameter not exceeding 1 inch. All these main pipes are fixed in the sewers, and wherever the time has to be delivered, transmitted or given to a customer, an ordinary gas-cock is inserted on the main pipe opposite the customer's house, and a branch pipe led from it into the building. This branch pipe is  $\frac{1}{4}$  inch in diameter. At each floor or landing as many small cocks are inserted on the ascending branch pipe as there are tenants, and on any tenant subscribing to the pneumatic system, a smaller pipe,  $\frac{1}{4}$  inch in diameter, is sub-branching on the ascending branch, and led into his apartments, where it is connected to the various clocks which are to be actuated. The latter are in reality mere engine counters, and there is in each clock a small bellows, which receives a puff of compressed air every minute, thus forcing the hand one minute forward. The advantages and extreme simplicity of the whole arrangement are readily apparent, and will not fail to be appreciated when once fairly tried.

### INDUSTRIAL ITEMS.

#### NEW HAMPSHIRE.

The Franconia Iron Company have purchased the necessary machinery, including engines, pumps and hoisting apparatus, for pumping out their mine and mining the ore. There is at present a good demand at paying prices for Franconia ore for smelting purposes.

#### VERMONT.

The Vermont Lock Works, at Springfield, were partially burned on the morning of the 27th inst. The loss is \$20,000; insurance, \$10,000.

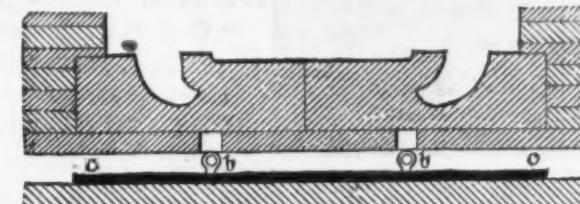
#### MASSACHUSETTS.

The Suffolk Iron Works, of Boston, have been incorporated with William Butterfield as president, and James G. Drew as treasurer. Their business is to carry on, with a capital of \$100,000, the casting, annealing and finishing of metals, and other cognate operations.

Work has begun on the new shop of the Auburn Foundry Company at Auburn.

The Brayton Petroleum Engine Company, at East Bridgewater, have this week made an experimental trial of the first engine built by them in their shops in this town. The past four months, since the establishment of the works in the old Matfield Locomotive Shop, has been occupied in fitting up the machine shop, which has necessitated the building and preparation of special tools and machines. The company are now ready, however, to manufacture the engine, a large number of which are ordered ahead. Their present intention is to build three engines per week.

Reed Brothers, tack and nail manufacturers, of Brockton, who have just com-



Casting an Anvil Bed.—Fig. 7.—Bottom of Mold. (For description see page 1.)

distributing one takes place, replacing the quantity of air which is at every minute discharged from the distributing receiver into the piping for actuating the clocks. The pressure of the compressed air in the distributing receiver is, therefore, constant.

The central or main clock, controlling the entire system of pneumatic clocks, is a pendulum clock of great precision and perfect mechanism, and connected with a particular contrivance specially adapted for the working of an equilibrium or balanced slide, which is successively opened and shut by the action of the main clock. This main clock is self-winding—that is to say, the counterweights which are actuating the main clock and the valve mechanism are constantly brought back to their former position by the action of the compressed air, and this at each pulsation of the compressed air.

The hands of the main clock travel in exactly the same manner as that of any ordinary clock, and the valve, the motion of which is dependent upon the mechanism propelling the hands, is actuated twice in every minute; the first operation, opening the valve, takes place at the 60th second of every minute; the second operation, shutting the valve, 20 seconds after, so that the valve remains open, and compressed air is admitted into the system of piping for a duration of 20 seconds at every time.

This space of time is the result of experience, and may vary according to the distances to which the compressed air has to travel. The valve chest is in direct communication with the distributing air receivers in exactly the same manner as the valve chest of a steam engine is in communication with the steam boiler, and it thus contains compressed air always at a constant pressure.

When, therefore, the valve is opened by the action of the main clock, there is a flow of compressed air in the several pipes, and all the clocks connected with them are actuated at the same time.

A duplicate main clock, with a valve attached, is kept going, and giving exactly the same time as the other, the valve being disconnected, so that, in case of anything happening to the main clock, the connection of the duplicate main clock with its valve is instantly and automatically made, and there is no interruption in the distribution of time. The pressure of the compressed air in the high-pressure and distributing receivers, the motion of the main

plated their mill, are now rolling their own plate.

The Boston Forge Company's works, at East Boston, started in 1866, and its capital stock increased to \$100,000 in 1873, is among the most important industries in this section. During the past two years and a half the company have manufactured \$750,000 worth of forgings. The pay roll during this time has been \$45,000 a year. Of the production during the above-named period there have been forged about 25,000 car axles, which have been sent to New York and Pennsylvania car builders and railroad companies. The company manufacture a number of steel forgings. The employment of 100 men has been the average for the past two years and a half.—*Boston Commercial Bulletin*.

Sheldon & Co., of East Bridgewater, are demolishing their old rolling mill and preparing to erect a very much larger one in its stead. Their specialty is rail and track plate, of which there is an increasing demand.

At Palmer the new iron mills are nearing completion. The company and their president now control 400 acres of land in that vicinity, so that the works will have plenty of room for expansion.

#### NEW JERSEY.

Messrs. MacPherson, Willard & Co.'s Union Steam Forge, in Bordentown, which employs about 160 hands, and which closed on May 28 on account of the slackness of trade, opened again last week with a slight reduction in the night force.

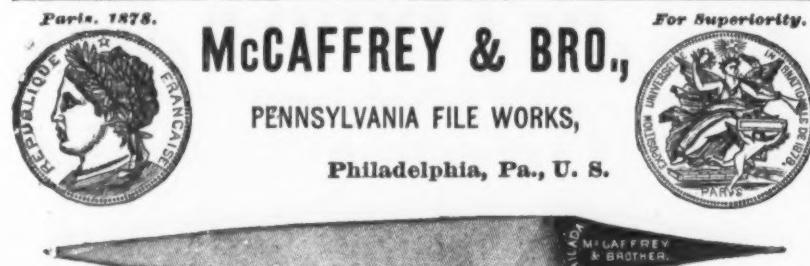
#### PENNSYLVANIA.

It is announced that the Jones mines, located near Joanna, Berks County, which are operated by the Phoenix Iron Co., of Phoenixville, have suspended operations. Some 40 miners were employed at the works, and the fires were drawn yesterday. The accumulated stock of ore and a decreased demand for pig iron is said to be the cause.

The Moslem Furnace, in Richmond township, Berks County, which had been lying idle for some time, undergoing repairs, is now ready to blow in, and a stock of material is being provided.

The mine of the Lehigh and Wilkesbarre Coal Company is on fire; 100 men are engaged in fighting the flames. At the time the fire was discovered a large number of miners were in the shaft, and were compelled to travel through abandoned workings in order to make their escape.

**AUBURN FILE WORKS,**  
Superior Hand-Cut  
**FILES AND RASPS,**  
MADE FROM IMPORTED STEEL. EVERY FILE WARRANTED.  
**FULLER BROS., Sole Agents,**  
89 Chambers and 71 Reade Streets, N. Y.



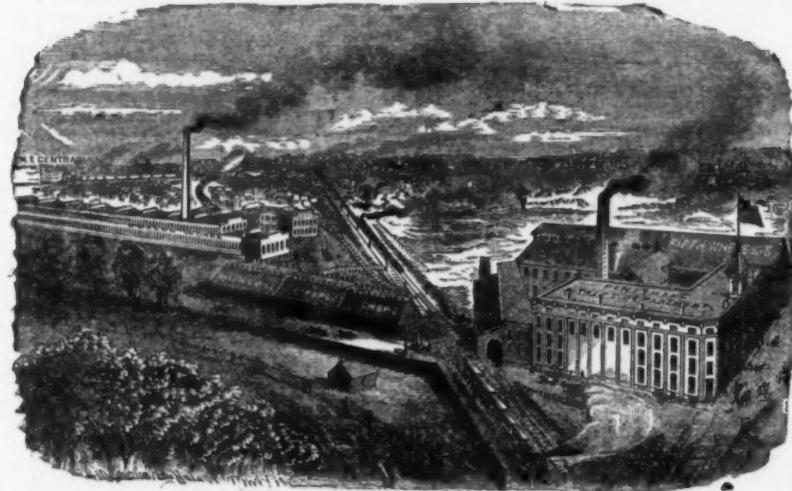
Manufacture and keep in stock a full line of **FILES** and **RASPS** only, for which we claim special advantages over the ordinary goods, and ask domestic and foreign buyers to allow us to compete for their trade.

Superiority acknowledged wherever used, sold or exhibited.

**GRAHAM & HAINES,**

P. O. Box 1049. 113 Chambers and 95 Reade Streets, New York.  
HARDWARE MANUFACTURERS' AGENTS, as follows:  
Detroit Block Works, WHEELING HINGE CO.,  
Tackie Blocks, Hinges and wrought Butts.  
Cotton, Wool and Curry Cards, Northwestern Horse Nail Co.,  
Scythia Snaths, A. G. COES & CO.,  
Otsego Fork Mills, COES' Genuine Screw Wrenches.  
Steel Forks, Rakes, Hoes, &c., F. K. Sibley, Emery Cloth.  
J. M. Nickels & CO., Buttress and Field Tiers, etc.  
Scythes, Axes and Tools, Ripley Mfg. Co., Mouse Trap.  
H. W. Kipp, Nail Hammer.  
Iron City Tool Works, Lam's Loring,  
Picks, Mattocks, Grub Hoes, &c., Plymout Hatch & Rivet Works.  
Jacobus & Nimich Mfg. Co., Carr, Crassey & Devlin,  
J. Mallinson, Miscellaneous Hardware & Cast  
Bandsaw Tool Co., J. Mallinson, Cast Steel Shears and Scissors.  
Geo. M. Eddy & Co., Ketcham's Pat. Metallic Sieves.

## CARRIAGE HARDWARE.



Our new Illustrated Catalogue of 140 pages, and over 300 illustrations, will be mailed on application.

**THE E. D. CLAPP MFG. CO., Auburn, N. Y.**



"THE ADAMSON"

BRANDING IRON,

WITH MOVABLE COPPER TYPE.  
Gives better satisfaction, brands all articles sharper and deeper, and lasts longer than any other kind of  
BRANDING IRON EVER MADE. Any Name or Number can be furnished in  $\frac{1}{4}$  in.,  $\frac{3}{8}$  in., or  $\frac{1}{2}$  in. size.  
They are compactly and MECHANICALLY constructed, and can be taken apart or put together again in a min-  
ute's time.

Liberal discount to the trade.

**ASA FARR, 64 College Place, New York.**

## MOLDING SAND AND FOUNDRY FACINGS.

OUR STOVE PLATE FACING IS ENDORSED BY THE LEADING STOVE FOUNDERS  
Read the Following Testimonials:

Office of FULLER, WARREN & CO., Troy, N. Y., February 21st, 1882.

To Whom it May Concern:  
We have during the past four months used about 75 barrels of the "WHITEHEAD STOVE  
PLATE FACING," and find it the best and most economical that we have ever had in our  
Works, and shall continue to use it while supplied with the present quality. This Facing  
is manufactured by the AMERICAN FACING CO., 515 West 15th Street, New York City.  
A. H. EATON, Superintendent.

SHOVELS, RIDDLES, BRUSHES, &c.

WHITEHEAD BROS.  
AMERICAN FACING CO.,  
515 and 517 West 15th St., New York.

## TUFTING BUTTON

PATENTED June 28, 1881.

THE AMERICAN TACK CO., Fairhaven, Mass.,

Are making TUFTING BUTTONS with every Eye soldered to its Back, giving them great Strength  
and Durability. All Buttons are guaranteed satisfactory. Also Lining and Saddle Nails, and every  
variety of

TACKS and NAILS.

New York Salesroom, 116 Chambers Street.

## Nicholson FILES.

Bandsaw Files,  
Boot Heel,  
Brass,  
Cabinet,  
Cant,  
Cotter Taper,  
Cotter Equaling,  
Cross or Crossing,  
Doctor,  
Drill,  
Feather Edge,  
Finishing,  
Flat  
Flat Equaling,  
Flat Wood,  
Gang-Edger,  
Ginsaw,  
Gulletting,  
Half-Round,  
Half-Round Wood,  
Hand,  
Hand Equaling,  
Handsaw Blunt,  
Handsaw (Double-Ender),  
Handsaw Taper, single cut,  
Handsaw Taper, double cut,  
Handsaw Taper, slim,  
High Back,  
Hook-Tooth,  
Knife,  
Knife Blunt,  
Lead Float,  
Lightning,  
Machine Mill,  
Mill,  
Mill Blunt,  
Mill Pointing,  
Pillar,  
Pitsaw,  
Reaper,  
Roller,  
Round,  
Round Blunt,  
Slotting,  
Slim Handsaw Taper,  
Square,  
Square Blunt,  
Square Equaling Files,  
Stave Saw,  
Three-Square Files,  
Three-Square Blunt Files,  
Tumbler Files,  
Union Cut,  
Warding Files,  
Warding Blunt File,  
Warding Round Edge File.

## RASPS.

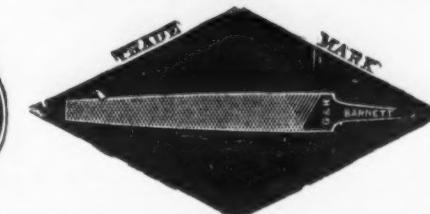
Baker's,  
Beveled Edge,  
Bread,  
Cabinet,  
File, Flat and Half Round,  
Flat Shoe,  
Flat Wood,  
Half-Round Shoe,  
Half-Round Wood,  
Horse, Plain and Tanged,  
Horse Mouth,  
Jig,  
Oval or French Shoe,  
Racer, Plain and Tanged.

## SPECIALTIES.

Butchers' Steels, Improved,  
Bent Riflers, Handled,  
File Cards,  
File Brushes,  
Machinists' Scrapers,  
Stub Files & Holder,  
Surface File Holder,  
Vise File Holder.

**NICHOLSON  
FILE CO.,  
PROVIDENCE,  
R. I.,**  
SOLE MANUFACTURERS.

## Black Diamond File Works.



Awarded by Jurors of Centennial Exposition, 1876, for  
"VERY SUPERIOR GOODS."

**G. & H. BARNETT,**  
39, 41 & 43 Richmond St., Philadelphia.

**CHARLES B. PAUL,**  
Manufacturer of **HAND CUT FILES.**

Warranted **CAST STEEL.**  
All descriptions of Files made to order. Price List mailed on application.

**UNION FILE WORKS,**  
311 to 315 North St.,  
BALTIMORE, MD.,  
Manufacturers of

## FILES AND RASPS

Made from the Best Refined Cast Steel.  
With all the requisite facilities to produce a first-class article, we are enabled to offer Files that will give entire satisfaction.

**MORITZ & KEIDEL, Agents,**  
48 & 50 German St., Baltimore, Md.

ESTABLISHED 1842.

INCORPORATED 1881.

CHAS. F. CRIPPS, President.  
**THE J. BARTON SMITH CO.,**  
Manufacturers of the Celebrated

**J. B. SMITH'S FILES, RASPS, WOOD SAWS, &c.,**  
Fourth and Somerset Streets, PHILADELPHIA.  
New York Branch, 128 Chambers Street.  
Prices the lowest. Goods the best.

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## FILE FORGING AND FILE GRINDING.

These machines have long been in use in this country and in Europe, and are unexcelled for perfection of work and labor saving. We now offer them with the latest improvements, and will apply them to forging and grinding other articles of tapering or otherwise irregular form.

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**THRIFT FILE WORKS,**  
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NORTHWESTERN FILE WORKS,  
65, 67 and 69 So. Canal St., Chicago,  
Make a specialty of 12 and 14-inch Flat. Will be  
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Repairs for Stoves made at Troy, Albany, Ro-  
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Price, \$3.00.

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We warrant these Faucets to be an improvement  
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more easily in heavy molasses than any Mea-  
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afford to be without them, for they save time,  
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drip. They prevent all waste, as no molasses  
or other fluid can be excepted from the  
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**WIRE CUTTER AND PLIER COMBINED.**  
Specially Adapted for Use on Wire Fence.  
Also Manufacturers of  
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Hand, Nut and Screw Taps, Pipe Taps and Reamers.  
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# WIRE NAILS, TACKS, SHOE NAILS,

And Every Variety of Small Nails.

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A SILVER MEDAL has been awarded above goods at the Paris Exposition, being the only medal awarded any American manufacturer of Tacks and Wire Nails.

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ALWAYS FIRST  
COMPETITIVEPREMIUM IN  
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CAUTION.—The popularity of the DUC BUCKET has caused many manufacturers of the old style of Elevator Bucket to closely imitate its spherical shape. We warn all parties against patronizing infringers of our patents, as they will be held accountable. Send for circular. Address

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We carry a large stock of the various sizes of Tinnings', Carriage, Wagon, Hame, Belt, Barrel, Safe and Tank Rivets, and make promptly to order all sizes not larger than 7-16 inch diameter. We have a capacity of two tons of the various sizes of small Rivets per day of ten hours. Freight allowed to all points on or east of the Mississippi River. Correspondence with buyers solicited.

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STANDARD  
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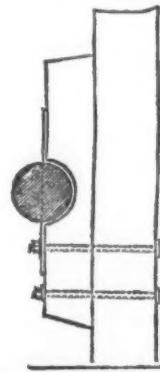
Hot Forged. from Norway Iron, Warranted Best Quality, Pointed and Polished.

HOWE &amp; CO., Troy, N. Y., Sole Agents.

entirely of granite. It may be of interest in this connection to state that a book, by Mr. E. P. Edwards, has just been published in England, entitled "The Eddystone Light-houses," containing an abstract of Mr. Smeaton's own account of his work, besides giving all the particulars of construction of the old lighthouse, and embodying numerous facts of general interest.

### Pneumatic Clocks.

The unification of time is a subject of unquestionable interest and importance, and has offered a wide field for enterprise, which appears to have been successfully cultivated by two Austrian engineers, Messrs. Popp and Reusch. The system proposed by them has already been adopted in Paris and Vienna, and it is understood that at the present time negotiations are pending to secure similar benefits for London. Their system is what is known as the pneumatic system, in which one single good clock is required, and at each station where the time is to be indicated only a very simple apparatus is necessary, which, moreover, requires no at-



Casting an Anvil Bed.—Fig. 6.—End View of Trunnion and Support. (For description see page 1.)

tention whatever. When once the system of pipes is laid down, the addition of almost any number of clocks makes no practical difference in the working, and it has been found in Paris that clocks may be supplied and maintained in private houses at trifling cost. The system, when first introduced, was found to be subject to some slight defects, which, however, have since been removed, rendering the working satisfactory in every respect. Nearly 20 miles of main pipes are now laid in the sewers of Paris, and about 1000 houses, in which there are upward of 5000 pneumatic clocks, are actually connected with and receive time from the main works, 14 public clocks, with 33 dials, being fixed in the public thoroughfares of the several districts. At the main works, which are situated in the center of these districts, air is compressed by means of steam engines actuating air-compressing machines, and stored in reservoirs, at a pressure varying from 15 to 45 pounds to the square inch. The air so compressed and stored is led into distributing receivers, after passing through a pressure regulator. A periodic transfer or discharge of compressed air from the high-pressure receivers into the

clock and its duplicates, as well as the self-winding mechanism and motion of the slide-valve, &c., are all automatically controlled, so as to require a minimum amount of supervision, and anything abnormal occurring is instantly and automatically signalled. The piping actually laid down in Paris is at the center or point of departure divided into 20 distinct parts, radiating from the center and leading to various quarters. These 20 miles of main are composed of lead pipes, the inside diameter not exceeding 1 inch. All these main pipes are fixed in the sewers, and wherever the time has to be delivered, transmitted or given to a customer, an ordinary gas-cock is inserted on the main pipe opposite the customer's house, and a branch pipe led from it into the building. This branch pipe is 1/4 inch in diameter. At each floor or landing as many small cocks are inserted on the ascending branch, and led into his apartments, where it is connected to the various clocks which are to be actuated. The latter are in reality mere engine counters, and there is in each clock a small bellows, which receives a puff of compressed air every minute, thus forcing the hand one minute forward. The advantages and extreme simplicity of the whole arrangement are readily apparent, and will not fail to be appreciated when once fairly tried.

### INDUSTRIAL ITEMS.

#### NEW HAMPSHIRE.

The Franconia Iron Company have purchased the necessary machinery, including engines, pumps and hoisting apparatus, for pumping out their mine and mining the ore. There is at present a good demand at paying prices for Franconia ore for settling purposes.

#### VERMONT.

The Vermont Lock Works, at Springfield, were partially burned on the morning of the 8th inst. The loss is \$20,000; insurance, \$10,000.

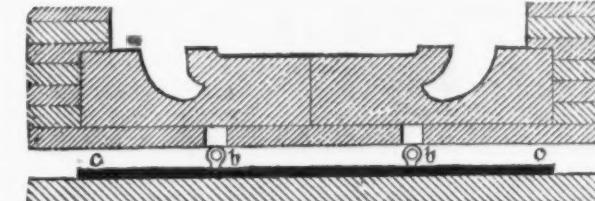
#### MASSACHUSETTS.

The Suffolk Iron Works, of Boston, have been incorporated with William Butterfield as president, and James G. Drew as treasurer. Their business is to carry on, with a capital of \$100,000, the casting, annealing and finishing of metals, and other cognate operations.

Work has begun on the new shop of the Auburn Foundry Company at Auburn.

The Brayton Petroleum Engine Company, at East Bridgewater, have this week made an experimental trial of the first engine built by them in their shops in this town. The past four months, since the establishment of the works in the old Matfield Locomotive Shops, has been occupied in fitting up the machine shops, which has necessitated the building and preparation of special tools and machines. The company are now ready, however, to manufacture the engine, a large number of which are ordered ahead. Their present intention is to build three engines per week.

Reed Brothers, tack and nail manufacturers, of Brockton, who have just com-



Casting an Anvil Bed.—Fig. 7.—Bottom of Mold. (For description see page 1.)

distributing one takes place, replacing the quantity of air which is at every minute discharged from the distributing receiver into the piping for actuating the clocks. The pressure of the compressed air in the distributing receiver is, therefore, constant.

The central or main clock, controlling the entire system of pneumatic clocks, is a pendulum clock of great precision and perfect mechanism, and connected with a particular contrivance specially adapted for the working of an equilibrium or balanced slide, which is successively opened and shut by the action of the main clock. This main clock is self-winding—that is to say, the counterweights which are actuating the main clock and the valve mechanism are constantly brought back to their former position by the action of the compressed air, and this at each pulsation of the compressed air. The hands of the main clock travel in exactly the same manner as that of any ordinary clock, and the valve, the motion of which is dependent upon the mechanism propelling the hands, is actuated twice in every minute; the first operation, opening the valve, takes place at the 6th second of every minute; the second operation, shutting the valve, 20 seconds after, so that the valve remains open, and compressed air is admitted into the system of piping for a duration of 20 seconds at every time. This space of time is the result of experience, and may vary according to the distances to which the compressed air has to travel. The valve chest is in direct communication with the distributing air receivers in exactly the same manner as the valve chest of a steam engine is in communication with the steam boiler, and it thus contains compressed air always at a constant pressure.

When, therefore, the valve is opened by the action of the main clock, there is a flow of compressed air in the several pipes, and all the clocks connected with them are actuated at the same time.

A duplicate main clock, with a valve attached, is kept going, and giving exactly the same time as the other, the valve being disconnected, so that, in case of anything happening to the main clock, the connection of the duplicate main clock with its valve is instantly and automatically made, and there is no interruption in the distribution of time. The pressure of the compressed air in the high-pressure and distributing receivers, the motion of the main

completed their mill, are now rolling their own plate.

The Boston Forge Company's works, at East Boston, started in 1866, and its capital stock increased to \$100,000 in 1873, is among the most important industries in this section.

During the past two years and a half the company have manufactured \$750,000 worth of forgings. The pay roll during this time has been \$45,000 a year. Of the production during the above-named period there have been forged about 25,000 car axles, which have been sent to New York and Pennsylvania car builders and railroad companies. The company manufacture a number of steel forgings. The employment of 100 men has been the average for the past two years and a half.—*Boston Commercial Bulletin*.

Sheldon & Co., of East Bridgewater, are demolishing their old rolling mill and preparing to erect a very much larger one in its stead. Their specialty is rail and track plate, of which there is an increasing demand.

At Palmer the new iron mills are nearing completion. The company and their president now control 400 acres of land in that vicinity, so that the works will have plenty of room for expansion.

#### NEW JERSEY.

Messrs. MacPherson, Willard & Co.'s Union Steam Forge, in Bordentown, which employs about 160 hands, and which closed on May 28 on account of the slackness of trade, opened again last week with a slight reduction in the night force.

#### PENNSYLVANIA.

It is announced that the Jones mines, located near Joanna, Berks County, which are operated by the Phoenix Iron Co., of Phoenixville, have suspended operations. Some 40 miners were employed at the works, and the fires were drawn yesterday. The accumulated stock of ore and a decreased demand for pig iron is said to be the cause.

The Moselem Furnace, in Richmond township, Berks County, which had been lying idle for some time, undergoing repairs, is now ready to blow in, and a stock of material is being provided.

The mine of the Lehigh and Wilkesbarre Coal Company is on fire; 100 men are engaged in fighting the flames. At the time the fire was discovered a large number of miners were in the shaft, and were compelled to travel through abandoned workings in order to make their escape.

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**THE**  
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**Salesroom and Warehouse,**  
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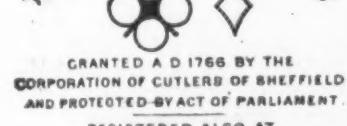
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Are warranted to be equal in style, finish and quality, to any goods made in the world.

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**AND**  
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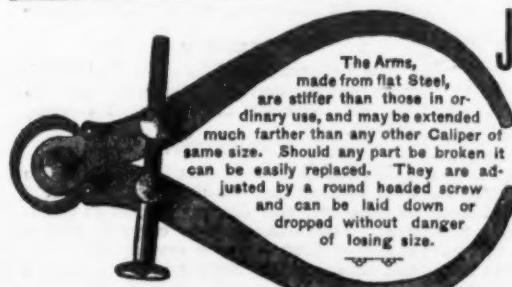


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Our Perfect Revolving Spoon is undoubtedly the best general Spoon for taking fish ever offered to the public.

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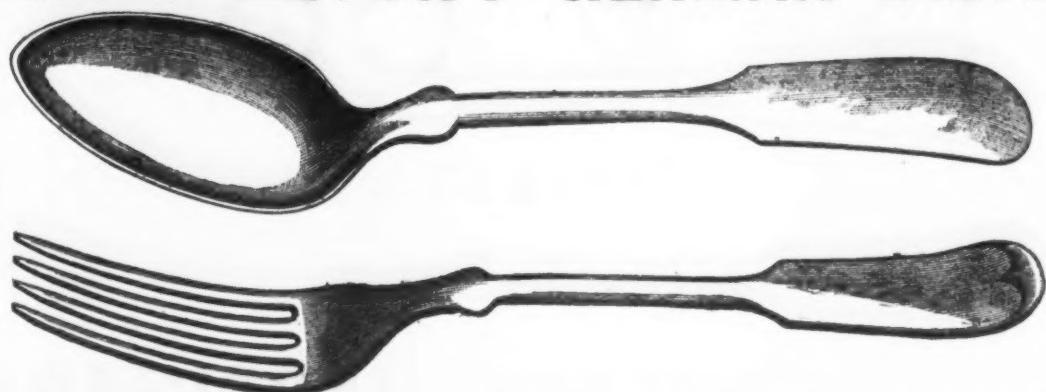
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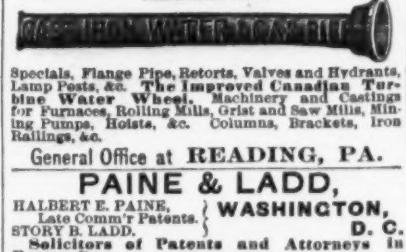
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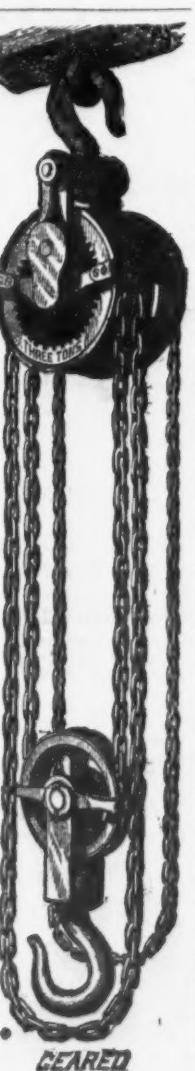
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DIRECT



The slate trade continues brisk and the demand is steadily increasing, many of the operators in Slatington being unable to meet the orders. The shipments for the three days ending May 31, were as follows: Roofing slate, 2232 squares; school slate, 193 cases; sawed school slate, 1 car; flagging, 76 pieces.

Work in the Hollidaysburg Foundry and Machine Shop has been suspended for the present. There was no strike in it, however, but one of the many results that will and may be expected to follow the suspension of work in other parts of the State.

Topton Furnace, which has been out of blast since last March for repairs, has been placed in first-class condition. The stack is being filled, and at an early day the match will be applied and the furnace will once again be in blast.

Negotiations that have been pending for the past week for the transfer of the large machine shop and foundry, the property of George W. Snyder & Co., of Pottsville, to the P. & R. Co., have been completed. The employees have gone to work under the new management. All contracts on hand unfinished by Snyder & Co. will be immediately filled, after which the shops will be kept running on colliery repairs.

No. 1 Aetna Furnace, at Newcastle, has been blown out for repairs.

At the furnace of the Warwick Iron Company, for the week ending June 3, 407½ tons of pig iron were manufactured.

Work was commenced at Lebanon last week on the first building of the Pennsylvania Bolt and Nut Company. It will be a frame building, 60 x 120 feet, to be used as a rolling mill, located next to the pipe-mill grounds. It is calculated to have it under roof in 90 days. All the other buildings are to be of brick, as follows: Nut and bolt factory, 80 x 120 feet; boiler house, 30 x 40 feet; burning room, 40 x 60 feet; machine shop, 60 x 120 feet; and a three-story brick warehouse, 50 x 150 feet.

The old Agricultural Works, at Rochester, were burned down on June 4. The Olive Stove Works, immediately adjacent, were damaged to the extent of \$2000, which loss is covered by insurance. A number of other buildings were destroyed.

Owing to the increased demand for "Chickies" pig iron, the Chickies Iron Co., of Chickies, have contracted with the Conaway's Iron Co., of Middletown, to manufacture this brand exclusively for them and under their direction. As they will now have three furnaces running on the same uniform mixture of ores, it will enable them to more promptly meet the requirements of their numerous customers.

### PITTSBURGH AND VICINITY.

An explosion occurred on last Sunday at D furnace of the Edgar Thomson Steel Works, one man being fatally and two others slightly injured.

Ripley & Co., glass manufacturers, have completed the stack of their new furnace. They are now busily engaged in completing the balance of the structure.

Shoenberger & Co. stopped one of their blast furnaces last Saturday night, and expect to stop the others shortly.

Thomas Coffin & Co., glass pot manufacturers, receive orders enough to keep them busily engaged; they have several new furnaces on hand now, both here and in the West, and they are working steadily on these and other contracts.

### OHIO.

The Mingo furnaces, at Mingo Junction, have been banked up on account of the labor troubles. The building of the company's new nail works will be completed during the coming autumn.

Phoenix Furnace, of Brown, Bonnell & Co., at Youngstown, made during its last blast of 240 weeks, 86,064 tons of metal. The blast extended from November 3d, 1877, to June 3d, 1882, when it was blown out. The furnace measures 15 x 60 feet.

The works of the Youngstown Malleable Iron Company have started up again under new management. Arrangements have been made to increase the capacity for production of the establishment, ground having been broken for a new addition 70 feet wide and 150 long. In addition to filling orders for the jobbing trade, the concern will manufacture the following goods: Lambert's malleable iron felloes, Oviatt's "Common Sense" riser and lock, and the New York "German" and "Victor" harness snaps. With the new addition completed and the establishment running full it will furnish employment to 125 persons.

It can now be said to a certainty that the Standard Coal and Iron Company have materialized, and that every arrangement has been made for the company to commence active operations by the 1st of July. The general manager of all the furnaces and iron interests will be Walter Crafts, and the coal property and its production will be under the supervision of T. Longstroth, of this city.—*Columbus Dispatch.*

The Ohio Falls Car Works have closed down for lack of work—600 men are out of employment.

The Forsyth Scale Works, Youngstown, are running in all departments with the exception of the foundry.

Taplin, Rice & Co., Akron, who employ 150 hands, have purchased the Sieberling Machine Works, which are now in running order.

The Anson Wood Reaper and Mower Works, Youngstown, have shut down on account of the scarcity of malleable iron—a result of the strike.

The frame for the factory of the Union Glass Works, Martin's Ferry, is up and the rear walls are about completed. The factory will be ready for the iron roof by Monday week.

The Lechner Mfg. Co., of Columbus, manufacturers of the Lechner mining machines and anti-friction roller detachable chains for transmitting power, are very busy, and are at this time working upon some good orders for both the chains and mining machines.

Messrs. Johnson Bros. & Luper, of Cincinnati, are about embarking in the hardware jobbing business, and are making present preparations to largely increase their present business. They are handling the Westphal patent screw case, and Porter's window and door screens.

The rolling mill crayons and metal work-

ers' crayons made at the works of D. M. Stewart, of Cincinnati, are meeting with quite a large sale, and are superseding the "French chalk" which was used to some extent previous to the commencement of the works of Mr. Stewart. Over 40 of the rolling mills of this country are using these crayons, which are found to give entire satisfaction.

According to contracts recently closed with several large engine builders, by the Miller Company, of Canton, the "Torrent" and "Unique" steam pumps will be used in connection with the agricultural and sawing engines turned out by such firms. The Miller Company have also provided the Sibley College of Mechanic Arts of the Cornell University with one of their new "Unique" pumps as a means of illustration and instruction. On account of the increased demand for the different sizes of these pumps, the company contemplate the erection of extensive additions to their works, plans for the same now being under consideration.

### ILLINOIS.

Weir & Craig have just added to their works a new boiler and \$3000 worth of machinery in order to enable them to keep up with their orders. They have also doubled the capacity of their pattern shop and brass foundry by an addition of 55 x 33 feet, three stories, brick, and are placing a number of improved furnaces in their brass foundry. Macfarren, Levy & Co. have just added to their works a heading, shaping and cutting-off machine, and report a brisk trade on brush machines and speed lathes. They are about completing two 17-inch engine lathes for their own use.

### MICHIGAN.

The following table exhibits, in gross tons, the total lake shipments of iron ore from Upper Peninsula ports the present season, up to and including May 31, together with the amount shipped during a corresponding period last year:

Name of port.	1881.	1882.
Escanaba.....	239,951	316,065
Marquette.....	45,063	164,375
L'Aune.....	3,793	8,185
St Ignace.....		2,812
Total.....	287,807	497,140

Showing an increase of 283,333 tons.—*Marquette Mining Journal.*

### LABOR AND WAGES.

The journeymen horseshoers of Chicago have gone out on a strike, to the number of 350. They demand the use of machine-made shoes and 25 cents per day advance.

The gas furnace men at the Union mills of Carnegie Bros. & Co., are still out on strike for an increase of \$2 per week.

The striking employees of the South Wareham Nail Company, at South Wareham, Mass., have received 10 per cent. advance, and will return to work on Monday.

The Schuylkill Coal Exchange has just issued the following circular:

POTTSVILLE, June 3, 1882.

The following collieries, drawn to furnish prices of coal, to determine rate of wages to be paid in May, 1882, make the following returns as the prices for that month:

Mahanoy City Colliery (P. & R. Co. & I. Co.)	\$2.42
Girard Colliery.....	3.37
Gilberton Colliery.....	2.42
Preston No. 2 Colliery.....	2.42
Cuyler Colliery (S. M. Heaton & Co.)	2.36

The average of these prices is \$2.39 95-100, and the rate of wages to be paid in May, 1882, is 5 per cent. below the \$2.50 basis.

The roll turners of the Pittsburgh district held a meeting on Saturday night to talk about organizing a protective association, but nothing was done definitely.

Owing to the superintendent of the pipe mill at the Reading Iron Works, Reading, Pa., having put up a notice requiring the tubes to be worked up properly and the floors kept clean, so that no imperfect pipe would be left over for the next turn to finish, the men at two of the welding furnaces stopped work on Thursday last, and in the evening the company issued orders that the mill be run with only a single turn until further notice. The next morning about 50 of the employees held a secret meeting and determined to make the following propositions to the company: Changing from piece to day work; no man to be responsible for another man's work; every man wants a set day's work; welders want \$5 a day; first straighteners, \$2.50; rodmen and revolvers, \$2.20; crab tenders, \$1.75; second straighteners, \$2.20; first firemen, \$3; and second firemen, \$2. A committee was appointed which waited upon Superintendent Wolf and presented the demand, desiring an answer by Tuesday evening. There is also complaint that the employees are kept waiting from half an hour to an hour each day for their time checks. The mill is now running on a single turn in day time only.

A large number of miners have been put to work at Cumberland, Md. Some trouble has been occasioned by the refusal of some of the trainmen to haul coal mined by the new hands, but this difficulty has been arranged.

The Tamarack Swamps, near Sharpsville, Pa., appear to be a serious obstacle to the work of the New York, Pennsylvania & Ohio Railroad Company, who undertook to lay a solid road-bed across them. In commencing operations a few thousand cubic yards of soil were dumped upon the surface, this quantity being deemed sufficient for all purposes. When the earth, however, immediately disappeared and left no trace behind, it was evident that additional material was necessary, and the Company accordingly purchased from a furnace the cinder which had accumulated during a period of 10 years. Within the past few months some 5000 car loads have been utilized without producing any visible result. Occasionally at night there are evidences of repletion, but in the morning the water presents an unruffled surface without any appearance of having been disturbed. A solid road bed could be laid close by, entirely avoiding the swamp, but it appears that the Company have determined to carry out their original plan notwithstanding all opposing difficulties.

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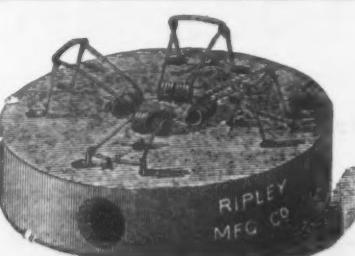
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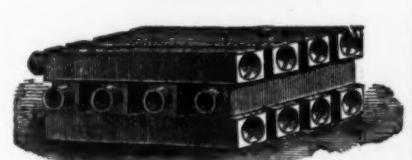


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AND

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Hon. Robert B. Roosevelt on Tuesday resigned as Brooklyn Bridge Trustee, alleging his inability to penetrate the mysteries of its management. His principal reason, given in a letter addressed to Mayor Grace, is that the bridge will probably not be finished for two years, on account of the delay in furnishing the steel, thereby placing the trustees in an uncomfortable position. It is time that official inquiries were instituted, in order to fix the responsibility for alleged mismanagement wherever it belongs, and to apply a corrective.

### The Labor Situation West.

There have been some important happenings in the iron strike in the West since those mentioned in our last issue. In the first place, however, it may be well to say that at this writing not an iron mill west of the Alleghenies has signed the scale which did not sign it the first day. Seven mills have signed, as before reported. The fact that two of these had signed was not known until some days after the strike began, but they all signed on or before the 1st of June. Since then there has not been a break in the ranks of the manufacturers. On the other hand, in addition to those mills that were running on the 1st, in spite of the Amalgamated rules breaks have been made in their ranks. The Superior Mill of A. Kloman, at Pittsburgh, has started up in some of its departments against the rules of the Union, and the Apollo Works of Laufman & Co., near Pittsburgh, were to start Wednesday morning of this week. This last is very significant. Mr. Laufman has in the past been especially friendly to the Amalgamated, and his action in defying it will have a decided influence in convincing its members that the manufacturers are in earnest and determined not to yield.

Another important factor in the situation was the action of the manufacturers at their meeting of the 7th, resulting in the formation of an organization. Of equal significance is their action in reaffirming by unanimous vote the action of the meeting of May 25, in refusing to pay any advance on the wages scales in force prior to June 1. It has been widely reported that the vote was not unanimous, but we have the best authority for our statement that there was not a vote against it, and the meeting was the largest ever held in the West.

Another feature is the backbone of the recalcitrants at Cincinnati, and the return to work last Monday. As we have explained, after the strike last year the Cincinnati ironworkers agreed to continue at work after June 1 at old prices, unless a scale was agreed upon at Pittsburgh, when this scale was to be the one paid. The workmen refused to be bound by the agreement. Mr. Jarrett, however, went to Cincinnati and prevailed upon the men to resume work. It may be stated that this action of the Cincinnati mills, so far as the manufacturers are concerned, is taken with the full knowledge and approval of the other Western manufacturers.

### Economy of Fuel in Iron and Steel Manufacture.

The economy of fuel in the manufacture of iron and steel has always been a subject of vital importance to ironmasters, although, so far as the general public is concerned, it appears that very little interest has been taken in the question of how far the available supplies of coal were being reduced, and to what extent they were wasted or economized. It is a well-known fact that enormous expenditures of fuel occurred under the old conditions of smelting pig iron, the records showing that the consumption in some cases rose as high as 9 tons and more per ton of iron produced. Within the past 50 years, however, all this has been changed, with immense advantage to all concerned. This reduced consumption of fuel may be ascribed to a combination of circumstances, such as increased temperature of the blast, the adoption of larger furnaces, and the utilization of the waste heat of the furnaces. Another circumstance directly affecting this economy has been the increasing use of hematite ores, suited to the production of Bessemer pig, inducing economy not alone in the blast furnace, but also in the preliminary operation of calcining. The introduction of fire-brick stoves has also largely contributed to economy of fuel in the blast furnace, varying, in many cases, from 10 to 20 per cent. In furnaces using raw coal, the economy runs sometimes from 7 to 8 cwt. per ton of pig. A comparison of the average consumption of fuel per ton of iron smelted in Great Britain and in the United States points to greater economy in our country, and is ascribed mainly to two causes: The greater richness of the ores employed, and the extensive use of anthracite, which, for smelting purposes, is almost equal to a similar weight of coke. The following details of the working of anthracite blast furnaces in the summer of 1881 are given on the authority of Messrs. Taws & Hartman, of Philadelphia:

Furnaces.	Coal used per Ton of Pig.	Ore Charged per Ton of Pig.	Height of Furnace.	Bosh.	Heat of Blast.	Average weekly make of Pig.
1.....	2,087	4,480	70	18	1,100	479
2.....	2,822	4,319	70	16	1,348	292
3.....	2,603	3,903	56	15	870	403
4.....	2,577	4,212	75	20	765	527
5.....	2,618	4,362	66	17	750	390

It will be seen from this that the minimum consumption was 1.1 tons of anthracite per ton of pig iron, and the maximum 1.3 tons. In the manufacture of charcoal iron the fuel economy noted in connection with mineral fuel has not been witnessed, although some progress has been made in this direction. The charcoal iron industry appears to be mainly centered in this country, where from

450,000 to 500,000 tons of pig are made annually from vegetable fuel, the total annual production of Europe probably not exceeding 350,000 tons. The exact production of American charcoal pig iron in the census year 1880 was 435,018 tons, and the quantity of charcoal used in its manufacture was 53,900,288 bushels = 498,000 tons of charcoal, giving an average consumption of 1.14 tons of charcoal per ton of pig. The consumption is, however, very often considerably within this limit, as shown by the following examples:

Deer Lake Furnace.	1,073
Mo-gan	1,053
Bay	1,056
Fayette	1,040
Elk Rapids	1,084

### Tin Plates and Brands.

During the past three or four years those favoring reform in the tin plate trade have waged a vigorous and, to a great extent, successful crusade against the iniquities which have been perpetrated under the cover of private brands. The business in private brands has been practically destroyed, and dealers who value their reputations are repudiating everything but makers' brands, or specialties which they guarantee and on the quality of which they stake their reputation. In most cases these special tins and terne can be, and are, imported by other houses under the names by which they are well known to the trade; but for this the consumer, even if he knows it, cares very little. It may be a fact that the "Eastlake," bright plates, in which he feels confidence, and which come to him carefully packed, and with each sheet separately wrapped in tissue paper, can be bought for a dollar less per box of importer under the name of "Ebbwpgx," or some other unpronounceable Welsh maker's brand. The cautious consumer, who has been deceived a great many times in one way or another, is not disposed to venture the experiment for the sake of saving the difference. He knows that "Eastlake" is a good plate, and the assurance that he is getting what he pays for is of more value to him than a saving in price would be if attended with the risk of disappointment. Technically, "Eastlake" may be a private brand, but it is not the kind of a private brand which it is to the interest of the consumer to discourage. A system of private brands, or private gradings, which are furnished with the guarantees of reputable dealers, may, after all, be the solution of the whole question.

Makers' brands are now the fashion, and these, with the kind of private brands we have just described, dealers are offering consumers, with many assurances that all the tricks of the trade ended when private brands were abandoned. These assurances, however, are not quite warranted by the facts of the case. The private brand was an expedient resorted to by the dealer in tin plates to deceive the consumer in any one of a dozen ways. Makers' brands are supposed to afford the buyer a guaranty of quality which is presumably good, but it is not exceeding the bounds of truth to say that they afford no such guaranty, and that very few of the tins which come to this country under makers' brands can safely be purchased on their names alone. Every importer can tell of large shipments of very poor plates under makers' brands which have a traditional reputation for excellence. The maker occasionally strikes a bad lot of iron, and rather than stand the loss involved, will foist inferior plates upon the trade, knowing that their brands will carry them through. The maker's brand is very likely to mean one thing to-day and another thing to-morrow, and in proportion as it is trusted it will be used by unprincipled people to deceive the consumer. We know of one grade of tin iron, however, that the question of economy in fuel is important. The various other processes, such as puddling, the production of Bessemer, open-hearth and crucible steel, foundry castings, tin plates, and forgings, all consume large quantities of fuel, which, though not to be compared to the quantities consumed by blast furnaces, are still worthy of consideration. This becomes readily apparent by an inspection of the following table, presented to the British Iron and Steel Institute in a paper by Mr. J. S. Jeans:

#### CONSUMPTION OF COAL IN THE MANUFACTURE, ETC., OF IRON AND STEEL IN 1881.

Country	Make of Pig Iron.	Quantity of Coal Raised.	Percentage of Total Coal used in Pig Iron Manufacture.
Austria-Hungary	4,000,000	1,000,000	25
Russia	16,000,000	1,000,000	6
Belgium	6,000,000	1,000,000	17
France	10,000,000	1,000,000	10
Germany	10,000,000	1,000,000	10
The United States	32,207,000	1,000,000	3
Tons.	Tons.	Tons.	Tons.
In the manufacture of pig iron.....	18,011,000	8,043,000	45
In the manufacture of Bessemer steel.....	906,000	67,000	7
In the manufacture of open-hearth steel.....	676,000	100,000	15
In the manufacture of crucible steel.....	120,000	200,000	60
In the manufacture of foundry castings.....	200,000	55,000	28
In the manufacture of forgings.....	45,000	12,000	27
In the treatment of plates, &c., for ship-building.....	506,000	12,000	24
Used in the manufacture of tires, axles, rivets, bolts, armor plates, wire and other articles.....	4,200,000	1,000,000	24
In the manufacture of boilers, engines and machinery.....	1,000,000	1,000,000	100
Total.....	34,574,000	1,000,000	3

This figure represents

### The Employers' Liability Act in Great Britain.

Judging from the numerous statements now advanced in Great Britain, it appears that the employers' liability act may be safely classed among the many irritating and annoying acts of Parliament so objectionable to large employers of labor. The act was undoubtedly passed mainly in the interest of the workingman, and though its aim is unquestionably one deserving encouragement and praise, it becomes readily apparent that penalties for injuries are sometimes imposed, notwithstanding the fact that the latter may have resulted directly from gross carelessness of the injured and against which no precautions could guard. The act is, therefore, evidently defective in an important point, and, in order to remove the difficulties of its practical working, measures were adopted by employers to protect each other's interests. Some of the employers of labor, as the London and North Western Railway Company, the Great Eastern Railway Company, and others, impose upon all their men "conditions of employment," the object being to make the heavy pecuniary compensation clauses of the Act inoperative. A mutual insurance fund was established to which employer and employee contribute in certain fixed proportions, and it is out of this fund, and not through the claim which the act empowers the men to make, that compensation is to be made. Although general satisfaction is expressed on both sides, so far as this step was concerned, the question has been raised whether it is permissible to set aside an Act of Parliament by a contract of the kind mentioned, and it is not improbable that considerable discussion will arise before this point is definitely disposed of. Vexatious cases, in direct connection with this subject, are of frequent occurrence in British courts, and from past experience it appears that employers often decline practical sympathy with sufferers in their employ when threatened by legal proceedings.

The correct interpretation of the principal clauses of the act also forms a subject demanding immediate and careful attention, cases often arising in which lawyers and judges of County Courts cannot arrive at a definite understanding. Such difficulties consequently foreshadow early changes, and it is feared that any imprudent steps in either direction will entail disastrous consequences. The act, in its present condition, cannot, however, be regarded as an effective means of solving the questions now of almost daily occurrence, and it is hoped that the great importance of the subject, as affecting the manufacturing and mining industries of Great Britain, will greatly contribute to a successful and satisfactory issue of the controversy.

### Expansion in Canada.

Schemes of whatever kind originating in the Dominion are nothing if not magnificent. This is true especially of railroads, canals, and other works of internal improvement. Another phase of this very laudable ambition to excel is seen in the measures taken for the development of Manitoba, by building railway lines and inviting immigration, accompanied with much loud trumpeting and extraordinary inducements in the shape of free passages and grants of land. It was not long ago, if we rightly recollect, that a Manitoba hen was discovered to have laid an egg with a gold coin inside of the shell. Some of the freshest among the new arrivals did not quite swallow the story, whatever may have been thought of the wonderful powers of deglution displayed by the fowl. A subject for more thoughtful consideration is found in the unprecedented expansion of loans, or extension of credits, on the part of banking institutions situated within the Dominion. At the annual meeting of the Bank of Montreal, held June 6th, Mr. Chas. F. Smithers in the chair, the president took occasion to remark that the total of loans and discounts during the last six months was beyond precedent, and that the profits of the institution had been correspondingly good—equal to an improvement of about 1½ per cent. compared with last year, when the net profits were \$400,000 in excess of the previous year. Doubtless no small share of these earnings was realized from loans in Wall street, but the local demands for capital have been, at the same time, very pressing. President Smithers evidently thinks it might be prudent now to take in sail. He says :

\* \* \* \* \* But the increase of business noted is not by any means confined to this bank; it is general, if not universal, and embraces all the items of discounts, deposits, circulation, &c. The total loans and discounts of all classes upon the 30th April show an increase over the same day in 1881 of \$16,000,000—amounting in all to the enormous sum of \$176,000,000, a sum which I am quite safe in saying they never reached before. In 1873 they touched \$16,000,000, which was thought to be, and doubtless was at that time, a very dangerous expansion; the result proved it, for the banks did not get back to safe limits without passing through a very severe ordeal, which overwhelmed some of them, seriously crippled others, and damaged all to a greater or less degree; and in calling attention to the much larger figures which have now been reached, I do not wish to be considered an alarmist; but, to say the least, the figures are somewhat startling. I am quite sensible that the conditions of the country have greatly changed, and we can perhaps carry a heavier load now; still it is the part of wisdom to look the matter squarely in the face. I do not say that I see trouble in the immediate future, but it is well that we should be on the lookout and be prepared if it does come. It is quite certain that we—that is the banks generally—cannot go on expanding at this rate much longer, and the sooner we understand that the better.

The chairman proceeded to say that it was an undeniable fact that trade was not in an altogether satisfactory condition, on account of light profits, stocks of merchandise remaining unsold, and a possibility that manufacturers are being overdone. Then there is the large falling off in the exports in the face of increasing imports. He also intimated that railroad building may be in advance of the necessities of population, and waiting for the country to grow is a tedious and painful process. These suggestions, coming from a leading financier in the Dominion, are worth heeding, for, to a certain extent, they apply to the country at large, irrespective of boundary lines. In the remarks above quoted the speaker finds relief in the great Northwest, which he says is "the hope of Canada." It is as producers that the new territories must exercise a most important influence on the future. Thence Canada must derive, in large measure, materials wherewith to correct the trade balance. At the same time manufacturers must be sedulously fostered, particularly in the export departments, and gradual lowering of prices will not be without good results in the latter respect.

The country is to be congratulated on the appointment by President Arthur of a Tariff Commission consisting of men presumably competent to grapple with the task committed to them. The selections made for this purpose are eminently judicious. In the main the appointed are not only in accord with the spirit of the present Administration, which is all-important as affording a guarantee against disturbing, or at least factious, influences, but they are men of a practical business character, familiar with economic questions affecting the interests of the country and fully alive to the requirements of the situation. There is reason to be wary of the advice so freely tendered, in some instances, by persons inimical to the present system of revenue. Merchants and manufacturers are not prepared for radical measures of whatever kind, however sincere or worthy the motives of those by whom they are urged. There has been shown among all classes considerable unanimity in regard to needed modifications of the tariff upon certain raw materials, but even these call for the exercise of a careful circumspection. The President evidently appreciates the delicacy, not to say dangers, of the work upon which the commission are about to enter. It is only to be regretted that any doubt could have existed as to the acceptance of proposed members of this body when they were apprised of their nomination.

An article is going the rounds of the daily press with the very taking title of "Coal by Wire." It is an outgrowth of speculation upon the possibilities of the dynamo of the future. The gist of the article is this: That by utilizing the immense water powers of various parts of the globe in driving dynamos, the power may be sent as electricity over comparatively small copper conductors to any point where it is desired to use it. This, of course, will do away with the necessity for the transportation of coal. It would also be possible to utilize the coal at the mines in driving engines, and then transmit their power to great distances, the profit, in that case, coming from cheap coal and the saving in its transportation. The possibilities of new combinations which the dynamo presents are so great, and our knowledge of its limitations so comparatively small, that the imagination is prone to run riot. At present we must wait for improved forms of dynamos, for there is too great a percentage of loss to allow us to introduce them into any and every situation where transmission of power may be desirable.

It appears highly probable that the basic process will soon be extensively adopted in the North of England, in order to permit a successful utilization of Cleveland ores for the production of steel. These ores have not within the past few years been in great demand, on account of the large importations of Spanish ores, and it is expected that the basic process will re-establish their popularity and increase the demand for them.

**The National Exhibition at Turin.**—It is stated that an influential general committee has been formed for holding a purely national exhibition at Turin, in the summer of 1884, as a complement to that of Milan last year. A site has been chosen and the buildings are to cover double the area of the Milan exhibition. The idea is rapidly progressing, and the shares of the guarantee fund are reported to be taken up well. An appeal to co-operate is made to industrial and scientific institutions, and local committees are to be formed throughout the country for serving as connecting links between the management and the exhibitors, and for interesting the population in the undertaking. They will, moreover, decide upon the quantity of proposed exhibits, assist producers in preparing and forwarding them, and ascertain whether the articles sent are really Italian productions. Another, and important office of the local committees, will be to obtain and impart information as to improved processes of manufacture, and as to foreign markets for produce. All natural products will be admitted, with a few obvious exceptions, a limit being put upon the quantities of stone, ores, metals, &c. The Art Commission make an appeal to Italian artists to contribute to the Fine Arts Exhibition that will be held in connection with a collection of ancient works of art. Consuls in other countries are also urged to interest foreigners in the exhibition, and induce them to visit it. It will be seen, therefore, that ample measures have been taken to secure interesting exhibits, and there seems to be no reason why the undertaking should not be crowned with success.

### The "House of Lords" and the "House of Commons."

The following letter has been sent for publication. It is in the main correct as to its statement of facts, but as it is obviously strongly *ex parte* statement, it makes the facts appear in a somewhat different light from that in which the gentlemen interested in organizing the "House of Lords" see them. If it should call out any statements as to why the membership of the "House of Commons" was discriminated against in the original plan, we shall print them with the same freedom that we do this:

NEW YORK, May 31, 1882.

To the Editor of *The Iron Age*.—DEAR SIR: Your valuable journal, with a proper regard to the interest taken by the trade in the subject, has carefully followed the two Exchanges through their successive developments. The various articles have, however, been necessarily disjointed, and now that one Exchange has already opened its rooms, and the other will do so in a short time, it may be of interest to your readers to give a connected *résumé* of the history of both, even though the statement is frankly an *ex parte* one.

The question of establishing an Exchange for iron and metals in New York had been discussed for years past, but with more earnestness since the beginning of 1881, and about the middle of January, 1882, the members of two brokerage firms came to the conclusion that the time had arrived for some definite action. After consultation as to the best way of going about it, they drew up a call for a general meeting of the trade, and secured the signatures of 20 prominent firms, all except one of these 20 being asked for and obtained directly by the two firms above alluded to.

The meeting took place at Delmonico's on February 15, and as—the object having been simply to get all who might be interested together—no attempt was made by the originators to "run" it, it was called to order, and the organization captured by a gentleman who, until that moment, was not known to take any interest in the matter, and who 15 minutes before had expressed a doubt as to being present at all. After a general discussion the chair was directed to appoint a committee of nine, who were to report in two weeks as to the advisability of establishing an Exchange and the best manner of so doing. The meeting then adopted a resolution that an Exchange, in its opinion, was desirable and practicable, and was about to adjourn to receive a report from the committee in two weeks, when the same gentleman who had called the meeting to order suggested the committee might not be quite ready within that time, and that it would be better to adjourn subject to call of the chair. The suggestion was adopted and the meeting adjourned, never to be called together again, either by chair or committee. This was on Wednesday, and on the next Monday the *Journal of Commerce* announced the names of the firms selected as members of the committee. Not only were the original movers entirely ignored, but not a single broker appeared on the list, and some of the firms named had publicly expressed their disapproval of the whole movement.

Two weeks passed with no notification of any action on the part of the committee, or report of their progress, when a circular was issued by them—which one member refused to sign, on the ground that they had no right to take such action—announcing that the signers, "appointed as a committee," were about to organize the "New York Iron and Metal Exchange," and asking the recipient to send in his name if he wished to become a member. This circular was distributed privately, apparently only to personal friends of the committeemen, but leaving out all brokers and any dealers or importers who were occasionally in the habit of doing business as brokers. It was the first intimation that the committee intended to exceed the powers granted them by the body to which they owed their existence, but was succeeded shortly by rumors that they were taking steps to incorporate themselves as a stock company, in which they and the friends on whom they could rely should have exclusive control, should admit or reject whom they pleased, and should dictate to the entire iron and metal trades of the country the manner in which the business should be done. At the expiration of another week, restive under the continued silence and inactivity of the committee as far as the public was concerned, nine firms addressed a joint letter to the chairman, requesting that another general meeting should be at once called. He replied, saying that the committee had not yet "matured their plans," but would doubtless have a report ready in "about 10 days." A second letter was addressed to him, making a more peremptory demand that the meeting should be called "to hear progress," to which the same reply was made as to the other. This was six weeks from the 15th of February, and while these letters were passing—on March 21st—the nine members of the committee had applied secretly to the office of the Secretary of the State for a certificate of incorporation—not a charter—under the General Business Act of New York State, with the curious title of the Iron and Metal Exchange Co., Limited. Had this action been first reported to the trade as a proposition for their approval, it would have been only a mistake, since the act does not contemplate exchanges, and makes no provision for their proper organization; but taken as it was, it was bit of bad faith, committed by nine prominent and reputable gentlemen, in whose hands a public trust had been reposed.

Having completed this organization by choosing shareholders from among those on whose support they could depend, and partitioning out a beggarly capital of \$3125 among them, they announced to the public that they were to receive associates at a due of \$75 per annum, for which they could have use of the company's rooms, but no voice in the management of its affairs, while the report flew rapidly that, in the selection of these associates, some persons who had happened to make themselves obnoxious to the directors were to be entirely excluded, and the whole brokerage interest was to be carefully sifted. Then came the Declaration of

Independence by those who did not believe that an exchange should be run on the same plan as an iron furnace or an ore company, and that the members of the iron and metal trade of New York City were quite capable to manage their own affairs, without the supervision of a handful of self-appointed dictators. A paper was at once put in circulation, binding the subscribers to it to pay \$100 for their seats in an exchange (with an annual due of \$25), the organization and control of which should be in the hands of all the members, the outcome of which has been the "House of Commons," an institution that bids fair to overshadow the "House of Lords," and establish itself as the popular branch, as its name indicates. It was a week or two before it was thought advisable to name a date for organization, but finally, on the 19th of April, it was decided to elect the officers on May 3d, "provided 100 members have then subscribed." Before May 3d over 200 had subscribed, and the New York Iron and Metal Exchange was an assured success. The process was a simple one, and no effort was made to exclude any one or to secure the benefits for a little clique of men. Everything has been done in open day, and the consequence is that as it has not disgraced others, it has obtained confidence for itself. Both houses stand ready now for the test of time and experience. The Lords have made various concessions, in view of the success of their rivals, first announcing that they would not exclude anybody, then that they would increase their stock for the benefit of the associates, and finally that they would give the associates a voice in the management of affairs. They still remain, however, a body in which not more than one-half the associates have any legal share in the property or profits, or any legal right to vote for officers or rules. They may be accorded such a privilege by courtesy of the shareholders, but at any time the latter so please they can resume all their power and relegate their less fortunate fellows to the position of lessees under dictation. They have taken a handsome room on Wall street, some distance from where the bulk of the business is done, and there the members have daily chats, for as they profess to have a holy horror of speculation, nothing that would look like the ordinary business of an Exchange is allowed, or even possible, under their rules. The company is controlled by two elements, those who wish to domineer and those who say frankly that they don't want any Exchange, and that theirs is an experiment for one year only. The Commons have started to be a permanency, and to this end have established a surplus fund of \$20,000 as a sort of nest-egg that makes each member's seat a valuable investment, with something always behind it that guarantees him against loss in any event. They have adopted, with a few slight alterations, the rules of the Produce Exchange, the most successful Exchange of its age in the world. Their building, which they will occupy as soon as the bank from which they have leased it moves out, is in the heart of the trade, and, when they move into it, they go with the intention not of making an experiment, but of building up a lasting institution. If from any cause they should ever wind up, there will be no question as to whom the surplus fund shall belong, for there are no shareholders with a legal right to any profit there may be. In this, as in all else, each member stands on an equal basis, not nominally and by a temporary courtesy, but actually and by right. What will be the outcome time only can tell, but the history of Exchanges is that every one founded on the basis of the House of Lords has failed, and every organization in a large trade, like that of the Commons, has been useful and a success. It is a matter for regret that the division should have taken place, but the Commons were obliged to carry out their plan in self-defense. Otherwise, the Lords would have assuredly failed in carrying out their plan, and so have prevented for all time the formation of an Exchange in New York. Perhaps it will not be long before we abolish this abnormal nobility, and each of the nine committeemen, even, will be glad to say that he is

WILLIAM NEILSON.

The death of Mr. William Neilson, of the Mossend Iron and Steel Works, has deprived the Scotch iron trade of one of its most noted members, one who occupied for many years a conspicuous position in bringing about the recent developments in the manufactured iron and steel trades of Scotland. Mr. Neilson belonged to a family that has been connected with the iron manufacturing and engineering industries for almost three-quarters of a century, and his uncle, J. B. Neilson, was the famous inventor of the hot blast for iron smelting. With the co-operation of his father and his two brothers, he started the Mossend Iron Works, near Glasgow, in 1840, and this establishment, though commenced on a small scale, was destined in course of time to become the largest works of the kind in that section of the country. Mr. Neilson was ever ready to adopt the most advanced notions as to rolling machinery and other plant, with the view of maintaining the high reputation which had been secured by the finished iron branded "Mossend." In that way he was one of the first iron manufacturers in Scotland to adopt reversing gearing in his rolling mills working on heavy plates and bars, and he was one of the earliest to employ the Siemens heat generative system for his reheating furnaces. It will be seen from this brief statement that Mr. Neilson, whose decease is now mourned by a large circle of relatives and friends, was in the front rank of the Scotch iron trade, and his name well deserves to be held in remembrance for many years.

### The National Association of Stove Manufacturers.

CHICAGO, ILL., May 30, 1882.

DEAR SIR: The Executive Committee, to whom was referred the subject of time and place for holding the semi-annual meeting, have decided that the most convenient place for all is Niagara Falls, and date of meeting June 21. Arrangements have been made with the proprietors of the Cataract House to provide accommodation for the association at reduced price. Yours respectfully,

WILLIAM H. SAND, Secretary.

Considering the preparation which has been made to digest a scheme for this meeting, so that the whole time can be profitably filled with the discussion of subjects of immediate and vital interest to the trade, we have no doubt it will be an unusually profitable meeting. The trouble hitherto has not been that the association had nothing to do, but that, owing to the lack of a well-digested order of business prepared in advance, hour after hour has been wasted, and the really profitable discussion has been carried on in the lobbies after adjournment. We hope this mistake will be corrected this year.

### NEW PUBLICATIONS.

THE KINEMATICS OF MACHINERY. Outlines of a Theory of Machines, by F. Reuleaux. Translated by Alex. B. W. Kennedy. Six hundred and eighteen pages, 451 engravings. Published by Macmillan & Co. Price, \$4.50.

The first feeling of the scholar in taking up this work is one of admiration and surprise, yet upon further examination he finds that it is truly what the title suggests, merely an outline. On the other hand, the mechanical man feels a keen disappointment in the reading. The analyses which, theoretically, are so beautiful, lack practical application in a way which can hardly be defined. There is often a temptation to find fault with the ultimate result attained, and to consider as compound those elements which are judged as simple. In reducing a great variety of the mechanical motions to "chains" of links a great step has been made, and yet this does not satisfy nor always aid the practical man in his work, though a flood of light is let in upon the science of mechanics by this analysis, and by means of it the author shows that a vast multitude of very dissimilar machines have similar mechanical elements. In this the work is decidedly valuable, and the chapters devoted to it are most instructive. When, however, the reader approaches the chapter on notation and synthesis, the fact becomes very apparent that the work is vastly better suited to drill the student than to aid the constructor or inventor. The terms used in the notation are many of them familiar, but a few are singularly unfortunate—as, for example, the use of the term "full" bodies instead of solid bodies, and "open" instead of hollow. This list might be much extended. Professor Reuleaux evidently appreciated the difficulty of his task in striking out a new path in an entirely new direction. While doing good work in pointing out what was needed and some of the steps by which we must obtain it, there are gaps to be filled, some of which have been but imperfectly bridged and others left for the student to pass as best he may. This work is in marked contrast to the same author's work upon machine design, which is most satisfactory in every respect to both the theoretical and practical mechanician. In this work the author attempts to put tools into the hands of the inventor, so that mechanical synthesis may be made easy and invention scientific, instead of a matter of "inspiration." In this the failure of the system is most signal, and yet at first sight it appears to be a success. To the designer of machinery it is, as Professor Thurston has happily shown, very useful, enabling the whole machine, in a certain sense, to be planned in advance. But designing, though very like inventing, is widely separated from it. The designer gives us a new machine, composed of known elements, working in old and well-known ways; there is no element of the "novel" in it. His work is the work of synthesis. The inventor of necessity works in a different manner, and those aids which the designer uses are handled in a very different fashion. That these methods may be reduced to philosophical methods, suitable for the inventor, there is no doubt, but it will be necessary to make a keener analysis of mechanics than has yet been done in order to accomplish this. The system of notation employed contains a germ of great value, which will probably be the foundation for the system of the future. The nomenclature strikes us as faulty, but

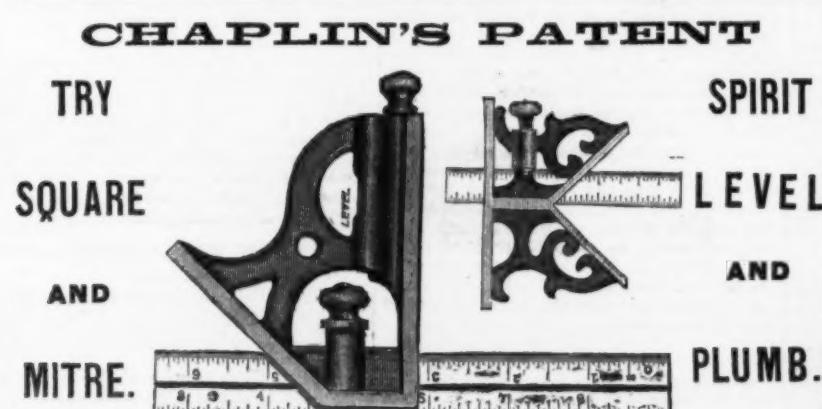
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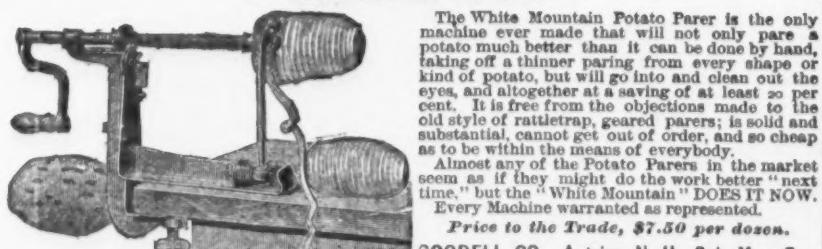
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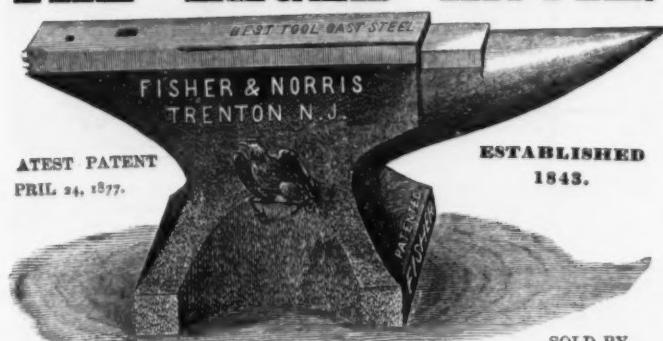
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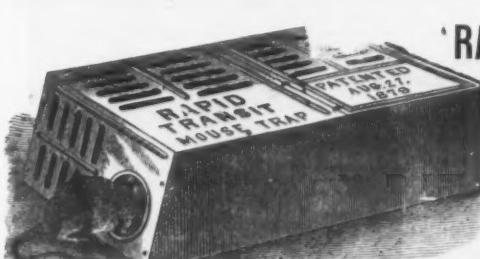
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this could hardly be otherwise in a work departing so radically from previous methods. In regard to the analysis of mechanical forms, to which we have alluded, we might speak at great length. At times it is exceedingly thorough and rigid, leaving nothing to be desired, notably in the matter of the general solution of the machine problem. At other times the analysis seems to have been stopped too soon, and the mechanism not reduced to its simplest form.

The book is finely printed; it has upward of 600 pages and contains 451 figures. Many of these figures are elaborate engravings, in that superlatively beautiful German style which, for mechanical work, leaves nothing to be desired. Though the student may not be entirely satisfied with the translation, the work as a whole will be a most useful contribution to a science which has a comparatively small literature.

this control, as it has on several occasions interfered with the proper administration of the office, and has established a scale of prices to suit itself and far above what their less fortunate brothers of the craft outside receive. It is claimed that a few days' delay in the operations of the printing office would break up this despotic sway. The Colorado Senator, in the forcible vernacular of his constituents, is "considerably on his ear," and refuses to be comforted until the authority of the Government has been vindicated.

#### THE IRON AND STEEL TEST COMMISSION.

General Campbell is still receiving a vast amount of epistolary stimulation on the subject of the Iron and Steel Test Bill, and is quite sanguine of its early consideration and passage. He repeats, however, that it would greatly facilitate his efforts if a few influential Representatives from different parts of the country were interested in the measure by letters addressed to them in the matter. Unless some special efforts are taken it will be impossible to reach the bill this session the way the business of Congress now stands.

#### THE LABORING CLASSES IN ENGLAND.

Prof. R. P. Porter, of the District of Columbia, one of the recently appointed Tariff Commissioners, about the time of his nomination had just returned from a visit to England, whether he had gone to look into some matters connected with the industrial problem in that country. Professor Porter's connection with the census of the United States, in charge of Wealth, Taxation and Public Indebtedness, had eminently qualified him to make a comparison between the two countries, and his observations, in studying the condition of the working classes of England, will be of immense value to the commission, as showing the effects of the industrial system and free trade upon that dependent element. Professor Porter says that, to begin with, England is but 1,000,000 acres larger than the State of Illinois; has eight times the population, and of this 12,000,000, or about one-half of the whole, live in the city of London and the four great manufacturing counties of Yorkshire, Staffordshire, Warwickshire and Lancashire. He estimates that there are upward of 1,000,000 paupers in the country, and by official report the administration of the poor laws employs 7000 paid officials, at an annual cost of \$5,000,000. He says the total cost of indoor and outdoor pauperism is no less than \$50,000,000. This alarming state of affairs is said to be due to the industrial system of the country, the existence of free trade, and the policy of holding prices below a minimum figure so as to undersell the manufacturers of other countries. This reduction of price is only justified by forcing down the rates of wages, and were it not for the protection which the Government here gives to its citizens, the working classes of the United States would be no better off than those in England, and, in fact, worse, for free trade as a part of our system, would stop all manufactures and throw our own working classes out of employment or compel them to come down to the level of the workingmen of England. Although Professor Porter favors the protection of American manufactures and labor on principle since his visit to England, he regards that theory as one of absolute self-preservation on the part of every working man, woman or child in the country.

#### THE EIGHT HOUR LAW.

Attorney-General Brewster having decided that more legislation is necessary before the President can execute the eight hour law, passed several years ago for the benefit of workingmen in the navy yards, arsenals and other establishments of the Government employing mechanical and manual labor, as a sort of indirect recognition of the general clamor upon this subject from the laboring classes, the President is beset by personal appeals of Representatives having such establishments in their districts, and Congress itself has received about a ream of petitions on the same subject from labor leagues, and other organizations of a similar character, urging action. The effort is being made to induce the President to send a special message to Congress urging the necessary legislation. It is a fact, which might be stated in this connection, that the very persons who urge these matters simply for political capital and buncome, regard this eight hour business as a great humbug, as if Congress had the power to say what should constitute a day's labor and its value in dollars and cents. Of course, if the Government proposes to give ten hours' pay for eight hours' work it can do so, but it has no power to establish that rule for private individuals.

#### GOVERNMENT INFORMATION ON THE STRIKES.

The information received at the Treasury Department in reference to the strikes at certain industrial centers, does not indicate that there is any disposition to resort to the desperate methods of the labor disturbances of a few years ago. The difference between capital and labor in the present instance seems to be superinduced solely by the increased cost of living. All the correspondence and other data in possession of the Government shows this, and it is claimed by the leaders of many labor organizations which have taken this step that the ruling prices of the product of all industrial establishments are such that an increase of wages could be granted without materially affecting profits. They assert that some of the simplest articles of food have gone up as high as 25 per cent, and the increase of wages asked, in most cases, does not exceed 10 per cent. Of course the Government claims no control over such matters, but as a measure of prudence it has kept fully advised as to the nature and extent of these difficulties.

#### SENATOR PLUMB AND THE PRINTERS' UNION.

There is a sort of side issue going on between the Senate and the Government Printing Office on the subject of trade unions, which looks as if there would be a lively time before it is disposed of. It appears that Senator Plumb, of Colorado, had a friend whom he desired appointed as a proof reader in the Government Printing Office. The Public Printer acquiesced in the request, and the appointment was made, but no sooner had it been done than the printers' union, which seems to be paramount in that immense establishment, raised a great hue and cry, and demanded the immediate removal of this non-union man.

The Public Printer was disposed to yield by compromising with these men, agreeing to transfer the appointee to some post which would not offend the autocratic notions of the union, and, at the same time, would not excite the hostility of the Senator. When spoken to on the subject, however, the Senator objected to any transfer, objected to any action inspired by the dictation of a trade union, and introduced a resolution of inquiry as to whether the Government Printing Office was run by any outside organization. The result has been an open issue, which Senator Plumb says he will test. The Senators generally favor breaking up

"Mysterious" Boiler Explosions.—The Locomotives recently received a communication from a well-known dealer in machinery, giving a striking illustration of the usual causes of many of our so-called "mysterious" boiler explosions. The gentleman says: A gentleman applied to us for a "cheap boiler," one that "would be good for two pounds or so." The only one we had had just been tested at 150 pounds to the square inch, but that was "too good." He said he once bought one for \$30, and ordered a young man in his employ to get up steam in it. He went away and was gone longer than he expected, and on his return he found a raging fire in the furnace, a pot filled with bricks on the safety-valve lever, and a very much frightened young man hanging on to the same lever with all his weight and both hands. The boy said, in explanation, that he didn't know anything about a boiler, but he supposed that if he "let any steam get out of that thing on top it would blow him and the shop to smithereens." "Ah!" said he, "I'm glad ye came, for I couldn't hold it much longer." It evidently came very near being another mysterious (?) explosion.



### Automatic Trimming and Squaring Machine.

The annexed illustration represents an automatic trimming and squaring machine just completed by Mr. E. W. Bliss, Plymouth, Pearl and John Streets, Brooklyn, N. Y. The machine is an entire novelty in its way, and we believe it is the first squaring machine ever built in which rotary shears have been employed. It trims accurately square 14 by 20 inch plates at the rate of 45 sheets per minute. The machine consists of a plain iron frame, carrying through its center slides and grippers by which the plate is moved. The sheet is fed in at the left-hand end of the machine by a spring guide, and held squarely against a stop. Grippers then carry it through the shears and under the feed rollers, which take the buckle out of it. Passing to the right hand of the machine, it stops for an instant, and the swinging arms, shown in the cut as standing out at an angle, drop down, pushing it against a stop, seize it and then draw it out at right angles to its former motion. In doing this two pairs of cutters trim the opposite ends, while rollers hold it and prevent it from springing. The second pair of shears are of course set at right angles to the first. This leaves the sheet trimmed on all four of its edges, which are straight, the opposite sides being parallel. In this form the machine is specially adapted to trimming and squaring 14 by 20 sheets for the bodies of five-gallon petroleum cans. The machine, however, is capable of being made to trim and cut sheets of tin for pint-can bodies. In some cases, the machine may be made to cut a strip from one side of the sheet at the same time that squaring is done, and to cut up the remaining portion of the sheet into two, three or four pieces, as may be desired. The weight complete is about 3500 pounds. The driving pulleys are 16 inches in diameter, with 4-inch facings, and make about 16 revolutions per minute. It is geared 4 to 1.

### The Iron Ore Resources of England.

The duration of ironstone in England is a subject of profound interest and importance, affecting, in no small measure, the wealth and power of the country, and the internal exhaustion of the once vast supplies is, therefore, worthy of some attention. Great changes have been experienced in this direction within the past 30 years, and the mines which at that time yielded the most abundant supplies are now rapidly dying out and giving way to new discoveries. With the exception of Lancashire and Cumberland, so well known for their hematite stone, the ores were generally raised from coal measures, or at least were connected with them. In South Wales the lower coal measures are large producers of iron ore, but this is now all changed, and the greatest producers of stone, and those that will long outlast those fields connected with the coal measures, were scarcely known 30 years ago, many having been discovered only within the last few years. These new fields are in no way connected with coal, being, in many cases, very far removed from such deposits. It was in 1850 that ironstone was discovered in Cleveland, which now yields over two-fifths of all the ore used, and which is the greatest iron and steel producing locality in the kingdom. About three years later iron ore was found in Northamptonshire, and a large field developed at Wellingborough. The ore has, however, also been worked in different parts of the country, and large supplies are now sent to South Wales, Derbyshire, Nottinghamshire, and some parts of the West Riding of Yorkshire.

The great advantage attending the Northamptonshire ore is that it may be obtained at a short distance below the surface and at a very small cost. The production now stands next to Cleveland, and the deposits may be said to be almost inexhaustible, and it is taken by ironmasters in different counties in preference to the deposits near to them in connection with the coal. A few years after having discovered the Northamptonshire deposit, ores of a similar character were discovered in Wiltshire, and four furnaces were erected with the view of conducting smelting operations. In 1859 a field of ironstone was discovered in North Lincolnshire, and it was found that the stone permeated a large part of the county and was of good quality. The two deposits just mentioned are of immense proportions and fairly rival Cleveland, the ore being richer in metallic iron. Rutlandshire also yields a considerable supply, and railway connections, which are now rapidly nearing completion, will greatly facilitate the transportation of the ore. The latest discovery of ore was made in Oxfordshire, where it is worked on the estate of the Duke of Marlborough. All these ironstones appear to be identical, and these odes, it may be said, have an uninterrupted range through Dorsetshire, Somersetshire, Gloucestershire, Oxfordshire, Northamptonshire, Rutlandshire, Lincolnshire, and into Yorkshire on its eastern border. It is evident, therefore, that the ironstone measures that are in no way connected with coal are those which will be depended upon in the future, and it is highly probable that they will be found in other counties than those in which they are now met with, since their extent cannot be even approximately determined. Their immense proportions, and the statements that they are practically inexhaustible, therefore, dispel all immediate danger of an iron-ore "famine."

**Sparks from Cast Iron Gears.**—In regard to the question whether the friction of cast-iron gears will produce sparks, a subject previously mentioned in our columns, a correspondent of the *American Miller* writes as follows: "I once had a pair of miter wheels running in the pit of my burst frame, driving two pair of runners; they were small wheels, some 2 feet in diameter, with about 7 inches face, both of them having the same number of cogs. One of them was on the upright shaft, it not being true on account of its having a coupling off. I took them apart

in order to have the toe of the upright shaft worked on, and I forgot to number the cogs. I had been running them some time, and they had worn with shoulders; I kept them well greased; a pretty large pile of grease had accumulated right under the wheels. After having the toe of the shaft repaired, I put them in gear again and started them to work. Having failed to put the cogs in the same places as they were before, it caused them to come in contact with the shoulders, and the friction being heavy, it caused them to rub or grind out sparks, which set the pile of grease on fire, and would have burned the mill if I had not discovered it in time. I have very little doubt but that a great many mill fires may be traced to the throwing of sparks by gears. There was no possibility of a fire starting in my mill except by these wheels. The insurance companies are laboring under a very great mistake if they think that cast-iron gearing will not produce sparks, and the fact above mentioned should be known among machinists."

### Some Plain Truths About Tin Plates.

The subjects of brands and qualities of tin plate at the present time are attracting so much attention that a brief account of what tin plates really are and what are the elements of their good and bad qualities, will be of interest to our readers.

Of the tin plates of commerce there are two general kinds: One is known as "tin plate," or "bright plate," and the other as "terne plate," or "roofing plate." The coating of the former is supposed to be pure tin, and the bright appearance which it pre-

vents of average quality, but not the very best. The loss of meaning in the other term is still more marked. "Best charcoals" at the present day are not the best made, but rather are plates a little under fair average in point of quality. Whatever the term may have signified when first used, it is now employed in what may be termed a technical sense alone. Plates of different quality are made in various sizes and different thicknesses or gauges. The commoner sizes in use are 10 by 14, 14 by 20, 20 by 28, 10 by 20, 12 by 12, &c. Each of these sizes is made of different gauges. The gauge marks employed upon tin plates are peculiar, and are unlike gauge marks used anywhere else. The thickness of plate most generally used in this country is indicated by the mark "IC," and by ordinary wire gauge is equal to about No. 29. The next thickness is marked "IX," and by wire gauge is nearly equivalent to Nos. 26 and 25 of the wire gauge respectively; additional X's represent still heavier gauges. It is not worth while in this connection to discuss the system of marks indicating thickness of plates in use, nor to attempt to account for certain arbitrary characters, such as those used in designating what are called "hundred" brands. Our purpose is merely to call attention to those features in connection with tin plate which will make our readers intelligent in judging of qualities, and in writing specifications.

The accompanying table gives the gauge marks, number of sheets per box, gross weight per box, regular sizes of tin and terne plates as now made up, and is

the sheet in the form of coating as would naturally adhere to it. Hence a thick, or as it is sometimes called, a wire, edge may be noticed on one side of many sheets. This also accounts for the extra heavy coating to be observed in spots where the tin had cooled before running off the sheet. By the process commonly known as "patent rolling" all this has been changed, and plates are now offered in the market the outward appearance of which is fully equal to the plates of an earlier period, but the coating of which is probably not one-third as thick. The thickness of the coating upon a sheet of tin plate may be easily tested by the use of a sharp-pointed knife. Use the knife as a plow and turn up a fine shaving of the coating. The naked eye will ordinarily suffice to judge of the thickness, but most satisfactory results are to be obtained by employing a magnifying glass in looking at the sample. By experimenting in this way upon a sheet of well-coated tin plate and patent rolled plate there will be no difficulty in arriving at a conclusion as to the relative quality and durability of the two samples tested.

Besides the kind of coating, quality of coating and thickness of coating upon the plate there is the matter of the evenness of the coating to be considered. For some purposes the patent rolled plate is to be preferred to the old-fashioned dipped plate, so far as appearance alone is concerned, because there are no blotches on the coating caused by undue thickness in certain places. However, it is not impossible to have an evenly-coated hand-dipped plate, and, therefore, this becomes an indication of quality. Uneven coating, unduly thick edges, blotches

by themselves in packing. Hence it follows that the wasters of almost any prominent brand of tin are, at some time or another, upon the market. Wasters are indicated, in branding the box, by placing the term itself in a conspicuous position across the end of the box, or by the initial W placed immediately after the brand, or immediately after the gauge mark, as, for example, "IC, W," or "IX, W."

All that we have said with reference to tin plates may be briefly summarized and put into convenient shape for reference, as follows:

*Tin Plate* is thin sheet iron coated with tin.

IC, IX, IXX, &c., refer to thickness of plates.

*Charcoal and Coke* refer to quality of iron in the plates.

*Bright and Terne, or Leaded*, refer to the coating of the plates.

10 x 14, 14 x 20, 10 x 20, &c., branded upon the boxes, indicates the size of the plates.

The *Brand* is some name, or device, or arrangement of letters of the general nature of a trade-mark, by which the quality of tin contained in the boxes is supposed to be indicated.

This brief summary shows how many points are to be considered upon the part of the consumer when selecting a tin plate for any specified purpose. When it is considered how many makers' brands there are in the market, how many fictitious brands are also in use, and further, that the quality of any make of tin plate is variable and uncertain, it will be seen how little value a brand is as compared with the actual test of the plates themselves. For many years large consumers of tin plates in various lines of trade have found it desirable to ignore brands entirely, and to buy and use plates upon the quality, determined by actual test.

### The Wire Gauge Controversy.

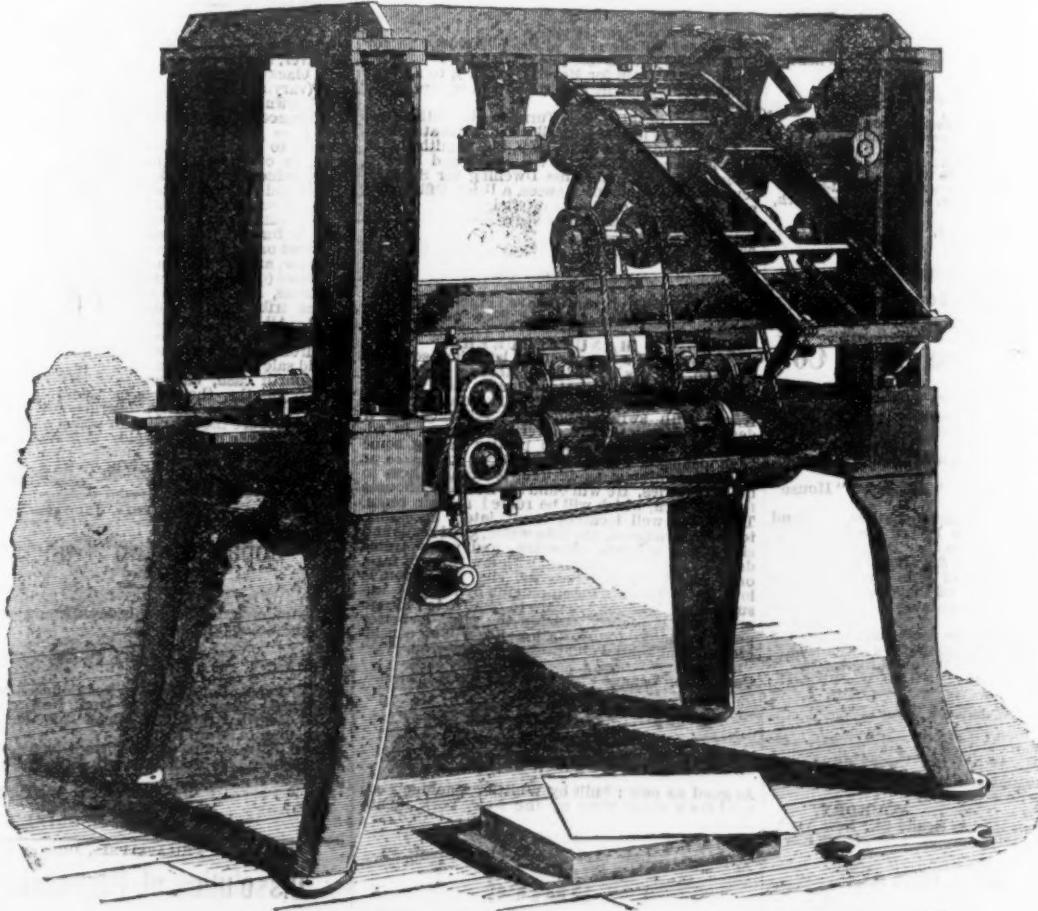
The arguments pro and con in the wire gauge controversy in England continue to fill the columns of our English exchanges. The following is an editorial from the *Ironmonger* of a recent date:

The battle of the wire gauges still rages, and does not seem to be nearer its climax than it has been any time these six months. Judging from the published utterances of the champions of the several styles and sizes at present in force, there appears to be little or no disposition in favor of a compromise; indeed, there is more heat in the controversy as it is prolonged. Under these conflicting conditions, it is difficult to venture anything resembling prophecy as to the result. The Board of Trade are understood to have issued about one hundred and sixty circulars to manufacturers in this country, and it will be odd if almost as many different opinions and suggestions are not forwarded to the department in response. Each of the districts affected is pretty certain to "go for its own hand," besides which individual makers have crotchetts of their own to air. That being the case, the Board of Trade will find little or no new information in the replies, but they will, at least, be convinced of the energetic manner in which the wire manufacturers agree to differ, and the great variety of opinion that exists on this head. Having no reliable guidance from those to whom they appealed, it is not impossible that the officials may elect to constitute themselves arbiters, and may introduce the system which they deem best. If we are to believe Mr. J. B. Brown, of London, Mr. Chaney, the head of the Standards Department of the Board of Trade, is in favor of the metrical system, hence we may anticipate that that plan will form the basis of the new arrangement. It would be supported by the Sheffield and certain other manufacturers, but it must be the decimal part of some English denomination of measure, and, therefore, could not be the metrical system pure and simple. We might thus have still another gauge legalized—indeed, it is suggested in our correspondence columns to-day by a gentleman well known in the North of England. Failing the consent of the majority of the wire trade, such an addition to our already too great wealth in this direction is wholly undesirable. That consent is not likely to be obtained; hence it is improbable that we are near the goal which everybody professes we ought to attain. What then, must be done? Either we must stand still or move on; but if we move, in what direction shall we bend our steps? Birmingham appears to be indifferent and Sheffield; but Warrington is pugnacious and Leeds is not to be accused of diffidence. All have claims to be heard in the settlement of this important question, but all cannot prevail. Compromise is inevitable, and the sooner it is formally arranged the better for the welfare of the wire and metal-rolling industries.

**Electrical Exhibition at Vienna.**—It is reported that an International Electrical Exhibition, to be held at Vienna this autumn, is now under consideration, considerable progress having already been made toward organizing the exhibition. Branch committees have been formed, and eminent electricians of Austria, Germany, France, Belgium and Holland are said to have promised support. The increasing importance of electricity in its application in various departments, especially in mining and metallurgy, warrants the assumption that the projected exhibition will probably be patronized by a large number of persons engaged in these pursuits.

Prof. Nordenskjöld during his Arctic voyage was perplexed by the question, What becomes of the bodies of animals which die a natural death? He very seldom found such remains, and declared that on Spitzbergen it was easier to find vertebrates of monster extinct reptiles than the bones of the seal, walrus or bird of the present day. The problem is yet unsolved. It must be that the living animals eat the dead ones.

The smallest circular saw in practical use is a disk about the size of a five cent piece, being employed for cutting the slits in gold pens. They are about as thick as ordinary paper, and make 400 revolutions per minute, this high speed keeping them rigid, notwithstanding their extreme thinness.



Automatic Trimming and Squaring Machine, Built by E. W. Bliss, Brooklyn, N. Y.

sents gives it the name by which it is most commonly designated, "bright plate." The coating of the second kind is composed chiefly of lead, which, being dull, or dead, in appearance, gives it the name usually applied to it, "terne," that term being a French word signifying "dull of appearance." In considering tin plate for any purpose whatever, it is necessary to examine both the plate and the coating with which it is covered. There are several important particulars to be taken into account with respect to each of these items in making a selection for any purpose.

Let us first give attention to the plate. Of the iron employed in the manufacture of tin plates there are two generally recognized grades or qualities, which are designated as "coke" and "charcoal" respectively. Originally these terms referred to the processes employed in making the iron. Latterly they indicate the quality in a somewhat arbitrary manner, irrespective of the particular fuel burned in the process of manufacturing the iron. In any event, it is impossible for the consumer to ascertain by what process the iron in his plates was made. Therefore, for him, at least, these terms are nothing more than general indications of the qualities of the plates to which they are applied.

Speaking in the most general terms, coke plates are inferior to charcoal plates. There are such variations in the so-called charcoal plates, however, that almost every degree of quality may be found among them alone. Hence, it does not follow that a charcoal plate is necessarily superior to all coke plates. Certain it is that the best qualities of coke plates are much to be preferred to the poorer grades of charcoal plates. With different qualities of coke plates and with different qualities of charcoal plates, still additional designating terms are brought into requisition. Coke plates are frequently designated as first quality, second quality or third quality. A like classification is sometimes applied to charcoal plates. Hence, the terms "first quality" and "second quality," or "first grade" and "second grade," are frequently met. In similar efforts to classify plates in a general way with respect to quality, the terms "prime charcoals" and "best charcoals" have been introduced. The use of these two terms is really more common than those to which we first alluded. By reason of their very common use, however, they have lost much of their literal significance. A fair interpretation of the term "prime charcoal" at the present time would probably be a fair article, a

the recognized standard of importers and jobbers:

Approx. thickness by wire gauge.	Gauge mark.	Size.	No. of sheets per box.	Av. weight lb.
No. .29	IC	10 x 14	225	120
No. .27	IX	10 x 14	225	130
No. .26	IIX	10 x 14	225	170
No. .25	IXXX	10 x 14	225	192
No. .24 1/2	IXXX	10 x 14	225	210
No. .23	DC	10 x 14	225	220
No. .22	IX	9 x 12	225	150
No. .21	IIX	9 x 12	225	170
No. .20	IXX	12 x 20	312	190
No. .25	IXXX	12 x 20	312	190
No. .24 1/2	IXXXX	12 x 20	112	210
No. .23	DC	12 x 20	285	100
No. .22	IX	12 x 20	285	125
No. .21	SDC	12 x 20	285	150
No. .20	SDX	12 x 20	285	170
No. .24 1/2	SDXX	12 x 20	285	215
No. .23	DC	12 x 15	100	105
No. .22	DX	12 x 15	100	135
No. .24	DXX	12 x 15	100	155
No. .23	DXXX	12 x 15	100	175
No. .22	DXXX	12 x 15	100	195
No. .24	IX	12 x 15	100	235
No. .23	IXX	12 x 15	100	250
No. .22	IXXX	12 x 15	100	270
No. .23	IXXX	12 x 15	100	305
No. .29	IC	12 x 14	225	170
No. .27	IX	12 x 14	225	192
No. .26	IIX	12 x 14	225	240
No. .25	IXXX	12 x 14	225	270
No. .24 1/2	IXXXX	12 x 14	225	300
No. .26	IXX	30 x 72	49	11 1/2
No. .25	IIXX	30 x 72	45	13
No. .24 1/2	IXXXX	30 x 72	45	14 1/2

From what has preceded it will be seen that the size and gauge of a plate is a matter entirely distinct from the coating. Whatever may be the quality of the iron out of which the plate is made, whatever may be its size and whatever its thickness, it may be coated with pure tin, with some alloy of tin or with a coating the principal ingredient of which is lead, producing terne plates, as already described. Further, a heavy coating may be applied or a very light one may be used. The consumer, in selecting tin plate, has all these several points to consider.

The principal defect in tin plates at the present time with respect to their coating, whether bright or terne, is in the thickness of the coating. The original process of manufacture was to dip each sheet in such a manner as to allow as much metal to remain on

## TRADE PUBLICATIONS.

## TOOLS FOR RAILWAY REPAIR SHOPS.

The L. B. Flanders Machine Works, Messrs. Fredrick & Ayer, No. 1025 Hamilton street, Philadelphia, Penn., have issued a neat catalogue for 1882, describing the special tools for railway repair shops made by this establishment. The first article illustrated is Flanders' patent crank-pin machine, for turning off crank-pins in position and while the wheels are under the engine. This is a very useful device, and has been lately improved. It does its work in a very rapid and satisfactory manner, maintaining the original centers of the pin. It is used quite extensively by some of the most important railroads in the country, among which may be mentioned the Pennsylvania Company, the Chicago and Grand Trunk Railway Company, Union Pacific Company, and others. The second device described is a portable valve-seat rotary planing machine, manufactured by this company. Following this is Flanders' improved locomotive-cylinder boring machine, which is adapted to boring out locomotive cylinders in their places by simply removing the heads and piston. Among the companies using this device may be mentioned the Illinois Central Company, Cleveland and Pittsburgh Company, the Chicago, Burlington and Quincy Railroad Company; and among the private concerns are the Baldwin Locomotive Works, the Rogers Locomotive Works, William Sellers, and others. A number of other improved tools are shown, among which may be mentioned Flanders' radius planer, for planing links, blocks and circular work on an ordinary planer. A steam chest seat milling machine, and a small portable engine called the "Gyp," specially made by this company for running its tools. The cylinder is 3 by 4 inches, upright. Independent of the fly-wheel the engine weighs only 115 pounds.

## THE PEERLESS TRACTION ENGINE.

We have received from the Geiser Manufacturing Co., Waynesboro, Pa., their illustrated catalogue for the current year, in which we find a description of the Landis "Peerless" traction or road locomotive, manufactured by this company. This engine was awarded the gold premium at the Ninth Cincinnati Industrial Exhibition, held at Cincinnati last fall, the specification of the jurors being for excellence of design and construction, and for superior performance during the expert test. At the trial of traction engines at Atlanta, Georgia, last December, this locomotive required only 6.94 horse-power for drawing a load of 11 tons one-half mile in 6½ minutes. Besides this form of engine the company manufacture a portable steam engine on wheels, adapted for farming use; also the same engine on sills, and what is called the "Domestic" steam engine, semi-portable in character, of from 2 to 4 horsepower. In addition to engines the company make thrashing machines, separators, saw-mills and various other specialties.

**Iron Mines at Dielette.**—The British Consul at Cherbourg, in the course of his report on the general state of France, states that the iron mines at Dielette, France, have been worked for some years past without success. Some new companies were recently formed for the development of the deposits, and entered into the possession of the mines at the beginning of the present year. The shafts appear to be sunk into a promontory jutting into the sea, and pass through layers of soft granite. The mines have been worked to the length of about 650 feet, and the ore is said to be very rich in iron. The successful development of the mine is, however, rendered very doubtful, since the workable lodes extend for some distance under the sea and gradually die out toward the land. Notwithstanding the great depth at which the ore is worked the water enters in considerable quantities, rendering continuous pumping indispensable, and greatly increasing the cost of extraction. The pumping is effected by a steam engine, which, by means of a strap working on wheels, lowers into the shaft a deep spheroidal bucket fitted with a valve, which is forced open when the bottom of the shaft is reached. The bucket then fills with water, and when hauled up again the weight of the latter firmly closes the valve, which is opened as soon as the surface is reached, allowing the water to escape by means of suitable conduits. This process of pumping is carried on continually. Notwithstanding the heavy expenses under which operations are carried on, the promoters of the new companies believe that the richness of the ore will ultimately compensate for all the drawbacks.

## Special Notices.

## ALL KINDS OF

## Gray Iron Castings

FINE QUALITY AND FINISH.

JOHN KEPPELMAN,

Cor. Second and Court Sts., Reading, Pa.

**WANTED.** TRAVELING SALESMAN  
To sell full line of Manufactured Hardware to the Jobbing trade in New York, Pennsylvania and New England States, including New York City, Philadelphia and Boston, for one of the largest manufacturing concerns in the country. Must be a thorough hardware man with a good established trade in the above territory. Address

MANUFACTURER,

Office of The Iron Age, 83 Reade St., New York.

## For Sale.

9 in. Merchant Mill, 56 Rolls.  
15 in. Merchant Mill, 6 ft. Rolls.  
Tilt Hammer for Blowers.

2-ton Rotocidle Turbines.

Lever Shears. Cam motion.

Crocodile Squeezers.

Heavy Roll Lathe, with small auxiliary Lathe.

2-ton Chain Blocks, double length chain.

A. G. BROOKS &amp; WINEBRENNER,

261 N. 3d St., Philadelphia.

TO MANUFACTURERS.—A gentleman who has an office in New York, is desirous of representing goods suitable for the Hardware and House Furnishing Goods Trade.

Address MANUFACTURERS' AGENT,

Office of The Iron Age, 83 Reade St., New York.

WANTED.

An active, enterprising American, with a capital of \$25,000, to go into partnership with a Hardware Manufacturer, on the mercantile plan in Russia. A good foundryman preferred. This is a first-class opening for a large fortune, for a pushing energetic party. The Russian market since the raise of duty in 1881, is just ready to buy such goods, principally builders' hardware, on a large scale. Please address

## Special Notices.

## SECOND-HAND AND NEW

## MACHINERY.

JUNE 15, 1882.

The following new and improved Machinery Tools are part of what we have for early delivery:

12 in. swing, 15 ft. bed New Engine Lathe. June.

14 in. swing, 20 ft. bed New Engine Lathe. June.

16 in. swing, 12 ft. bed New Engine Lathe. June.

18 in. swing, 13 ft. bed New Engine Lathe. June.

20 in. swing, 15 ft. bed New Engine Lathe. June.

22 in. swing, 18 ft. bed New Engine Lathe. June.

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226 in. swing, 222 ft. bed New Engine Lathe. June.

228 in. swing, 224 ft. bed New Engine Lathe. June.

**Special Notices.**  
**Furnace Property**  
**For Sale.**

Will be sold at a low price. The Charter Rights and Real Estate of the Bloomsburg Iron Co., together with such portions of the stock of materials and other personal property as purchasers may require. The real estate consists of two blast furnaces favorably known as the Irondale Furnaces, in good condition, steam engine, water power of 100 to 100 horse-power, lands with extensive iron mines, steel works, numerous dwelling houses, brickworks and sidings, several miles in length (connecting the furnaces with both Canal and Railroad), canal wharves with tracks and facilities for receiving and shipping large quantities of freight with economy and dispatch, either by canal or railroad.

This property is situated at Bloomsburg, Pa., within 10 miles of the Wyoming Coal field.

The furnaces have been in continuous and successful use for 37 years. The Company own in addition extensive and valuable ore mines in Snyder Co., Pa.

All the property is in good order and now in profitable use. For further information apply to

CHAS. R. PAXTON, President,  
 Bloomsburg, Pa.

**DESIRABLE MANUFACTURING SITE**  
**For Sale or Rent.**

Being the extensive property formerly occupied by the

**BUFFALO IRON AND NAIL WORKS AT BLACK ROCK, IN THIS CITY.**

The buildings cover over three acres, and are of brick and wood, substantially constructed, and with slate roofs. They could easily be changed, if necessary, to suit almost any kind of business.

Water and railroad communication to all parts of the country.

Maps of the property, with full description, sent on application.

F. P. PRATT or F. L. PRATT,  
 Buffalo, N. Y.

**The Sherman Process Co.**

9 Pemberton Square, Boston, Mass.,  
 Issue Licenses to use the Process for the  
 Manufacture of Iron and Steel

In the Bessemer Converter, Crucible, Siemens-Martin, Puddling, Blast and Cupola Furnaces.

The use of this Process improves the quality of the product, saves fuel and labor, and does not require any change in furnace or manner of working. See page 17 of The Iron Age of Oct. 25th, 1877.

**For Sale.**

The Industrial Works of Shamokin, owned and successfully carried on for a number of years by the late Wm. Brown, deceased, consisting of Foundry and Machine Shop, and a large stock of Patterns required as part of the property. Boiler Shop, Blacksmith Shop and Face Shop, the manufacturing of which is now discontinued. Well located in the borough of Shamokin, Pa., with the best facilities for shipping by rail, and surrounded by a district contributing all the work that a shop of that kind can possibly turn out. The works are now running, but in a very short time possession can be given. Easy terms of payment are offered to suit a purchaser of limited capital.

Offered for sale by

WM. MCILVAIN & SONS,  
 Reading, Pa.

**Hardware Business For Sale.**

Stock of hardware, stoves, tinware, etc., in elegant hardware store; three new railroads now building, and trade rapidly growing. A good party wishing a fine business will do well to investigate.

Address W. W. Box K, N. Y.

**For Sale.**

The largest stock of New and Second-hand Engines, Boilers, and general Machinery in the West. Send for Catalogue. Hoisting Outfits for Coal Mining and other purposes a specialty.

WARREN SPRINGER,  
 105 to 219 South Canal St., Chicago.

**FOR SALE LOW.—ENGINE.**

A Vertical High-Pressure Steam Engine, complete, Cylinder, 24 in. by 48 in. Built by A. J. Sweeney & Son. Can be seen in daily use at our nail factory.

LA BELLE IRON WORKS,  
 Wheeling, West Va.

**For Sale.**

One pair good, sound CHILLED ROLLS, 25 in. x 6 in., made by A. Garrison & Co., Pittsburgh. No use for them.

Also a HEATER, 18 in. x 6 in., with 21 1/2-inch tubes. Been used some. Will sell cheap.

CHAS. HUSTON & SONS,  
 Coatesville, Chester County, Pa.

**For Sale.**

A Hardware and General Housefurnishing Store, situated in a lively mining town in Pennsylvania, and doing a good and safe business. Stock running from \$10,000 to \$15,000 worth, over 1000 items, only hardware store in the place; reason for selling, going away. Address for further information,

BOX F.

Office of The Iron Age, 83 Reade St., New York.

**Machinery For Sale. (All New).**  
 One 20-in. Power Drill Press. Three 20-in. Davis Power Drill Presses. Six Hand Blacksmith Drills. Three Gear Cutting Attachments for Lathes. Twelve Assorted Chucks, 4 in. to 18 in. One Bolt Cutter, 14 in. to 16 in. Three Barnes Lathes. Six Hand Shearing and Punching Machines. Two Sturtevant Blowers. Also, one second-hand Horizontal Engine, 12 x 24. One second-hand Horizontal Engine, 10 x 16. JACKSON & TYLER,  
 16 and 18 S. Howard St., Baltimore.

**For Sale.**

**Two Corliss Condensing Beam Engines,**  
 32 in. x 72 in. cylinders. Address,  
 THE HARTFORD ENGINEERING CO.,  
 Hartford, Conn.

**Export.**

An American of middle age, with a long business experience in Foreign countries, is making up a voyage to the East Indies, Australia, New Zealand and Cape Colonies, Africa, and will take a sample line of American hardware, machinery and specialties, if a sufficient number of responsible houses apply. Solid references given.

Address TRAVELER,  
 P. O. Box 452, New Haven, Conn.

# Trade Report.

## BRITISH IRON AND METAL MARKETS.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, June 14, 1882.

**Scotch Pig.**—The market is active and prices firmer. As compared with last week, quotations have been advanced 6d. for Gartsherrie, Carnbroe and Eglington. The following are to-day's quotations for No. 1 brands:

Langloan, alongside, Glasgow.....	59/-
Coltness .....	59/-
Gartsherrie .....	58 1/2
Summerlee .....	57/-
Carnbroe .....	58/-
Glenegarnock .....	51 1/2
Eglington .....	49/-

Lighterage from Ardrossan to Glasgow is 2/- @ 5/- per ton.

**Cleveland Pig.**—The tone of the market has materially improved, under an increased demand, and prices are firmer, though no changes in quotations are reported. We quote as follows, f. o. b. shipping ports:

Middlesb' No. 2 Foundry .....	47 1/2
No. 2 .....	45 1/2
No. 3 .....	43 1/2
No. 4 Forge .....	42 1/2

**Bessemer Pig.**—The improved condition of the market noted last week continues, and prices rule firm. West Coast Brandas mixtures, Nos. 1, 2 and 3, are quoted 53/- @ 55/- f. o. b. shipping ports.

**Blooms.**—There is no improvement to note, and the market closes dull, with prices weak. Bessemer 7" x 7" are quoted £4. 5/- @ £4. 10/- f. o. b. shipping port.

**Manufactured Iron.**—The market continues active, and prices are steady. We quote as follows, at works:

	£ s. d.	£ s. d.
Staff. Ord. Marked Bars.....	7 0 0	7 10 0
" Medium .....	7 0 0	7 10 0
" Common .....	6 0 0	6 10 0

Hoops, 20 W.G. & over.

Common Best .....	8 0 0	8 10 0
" Medium .....	7 0 0	7 5 0
" Common .....	6 10 0	6 15 0

Sheets, 20 W.G. & under.

Ordinary Best .....	8 10 0	9 0 0
" Common .....	8 0 0	8 10 0

Welsh Bars .....

5 7 6 @ 5 12 6

**Steel Rails.**—The demand during the week has been light, and business small. Prices are steady. We quote ordinary sections, £5. 5/- @ £5. 15/- f. o. b. shipping port.

**Iron Rails.**—No change to note. The market is dull, and prices are weak. We quote Welsh, 30 lb and upward, nominally, £5. 5/- f. o. b. shipping port.

**Old Rails.**—The market is quiet, with offerings moderate and prices steady. We quote as follows, c. i. f. New York: Old Tees, £3. 15/- @ £3. 17 1/2; and Old D. H.'s, £4. 2/6 @ £4. 5/-.

**Scrap.**—The market is dull, and prices weak. Heavy Wrought is quoted £4. 1/2, c. i. f. New York. Bessemer Crop Ends, run of the mill, are quoted £0. 10/- f. o. b. shipping port.

**Copper.**—There is a considerable falling off in the demand, and prices are tending in buyers' favor. Transactions during the week have been small. Best Selected is quoted £73 @ £74, and Chili Bars, £66. 15/- @ £67.

**Tin.**—The market is dull and prices weak. The demand has declined. We quote Straits Ingots, spot, £95. 10/-.

**Tin Plates.**—The market is quiet, with demand and prices steady. We quote as follows:

Tin Plates, 10 x 14, 1st qual. Charcoal.....	21/-
" 2d " .....	18/-
" 1st " .....	16/-
" 2d " .....	15 1/2

**Spelter.**—There is no feature of interest to report, the market ruling dull and prices weak. Ordinary is quoted £17 @ £17. 10/- at shipping port.

**Lead.**—Business continues light, with prices a little firmer. We quote Common English Pig, £14. 10/- @ £14. 15/-.

**Freights.**—Are unchanged. Steam from Glasgow to New York, 15/-; ditto from Liverpool to New York, 10/- @ 11/-; and Liverpool to Philadelphia, 10/- @ 11/-.

**FINANCIAL.**

Office of The Iron Age, Wednesday, June 14, 1882.

syndicate for the Italian loan prefer, the object being to float the bonds at the highest price. As before observed, the shipments now making are arbitrary, being in no degree governed by the rates of exchange. The market for sterling is fairly active at £4. 86 1/2 @ £4. 86 1/2 and £4. 89 @ £4. 89 for prime bankers' bills, the posted rates being unchanged. A tolerable insight into the present monetary relations of this country and Europe is afforded by the London *Economist*, which says: "The internal demand for money does not certainly point in the direction of dearer money. The requirements of bullion for France and Italy, and the imports of the same from America, may have more influence in this respect. These may probably about balance each other just now. Thus, our reserve may not be strengthened by the stream of bullion which is passing through the country. And while it is difficult to point out the exact moment at which the importations from America may cease, there are symptoms now appearing that they may be approaching their limit more rapidly than seemed likely a short time ago. It would only require an increase of confidence in American railways to cause their bonds to be remitted instead of bullion. The influence of a small issue of such bonds which took place on this side a few days ago was immediately traceable in exchange operations. A remittance of sound securities is a far more satisfactory method of settling international exchange operations than a remittance of specie, and with a greater confidence in American railway securities the import of bullion which has recently occurred would, at the present value of money in our market, have hardly been needed."

On the Stock Exchange during the week under review the market has been severely raided, with depressing effects at the beginning, but with a subsequent advance affecting almost the entire list. The feverish, and at times decidedly weak, condition of the market arose from rumors of impending failures, the stocks most affected being Denver and Rio Grande, Louisville and Nashville, Ontario and Western and Missouri Pacific. Thus, the advance on Thursday was lost on Friday, but the market closed strong on the receipt of more favorable news from Pittsburgh. On Monday and Tuesday further encouraging reports from the grain fields, and rumors that rates would be advanced on the trunk lines, induced a covering of short contracts and consequent rally in prices. Gold shipments contemplated for Wednesday's steamer had no effect. To-day the market was strong until near the close. The leading stocks to-day ranged as follows: Lake Shore, 104 1/2 @ 104 3/4; New York Central, 129 1/2 @ 132; Delaware, Lackawanna and Western, 121 1/2 @ 124; Denver and Rio Grande, 56 1/2 @ 59 1/2; Texas and Pacific, 39 @ 41 1/2; Western Union Telegraph, 83 1/2 @ 85; Reading, 55 1/2 @ 59 1/2; Northern Pacific preferred, 70 1/2 @ 78 1/2; Missouri Pacific, 92 @ 94 1/2; Louisville and Nashville, 65 1/2 @ 68 1/2; Jersey Central, 68 1/2 @ 71 1/2; and Erie, 35 1/2 @ 36 1/2.

**Steel Rails.**—The demand during the week has been light, and business small. Prices are steady. We quote ordinary sections, £5. 5/- @ £5. 15/- f. o. b. shipping port.

**Old Rails.**—The market is quiet, with offerings moderate and prices steady. We quote as follows, c. i. f. New York: Old Tees, £3. 15/- @ £3. 17 1/2; and Old D. H.'s, £4. 2/6 @ £4. 5/-.

**Scrap.**—The market is dull, and prices weak. Heavy Wrought is quoted £4. 1/2, c. i. f. New York. Bessemer Crop Ends, run of the mill, are



**Steel Blooms.**—There is some inquiry for Blooms, but it is uncertain whether it will lead to business. Sellers are offering to take orders at \$35, which appears to be a little beyond buyers' ideas of value.

**Iron Rails.**—Except in very small lots, there is nothing doing. Prices are steady at \$450 @ \$48 at mill, according to size or order and weight of Rail.

**Old Rails.**—The market is very quiet, with light offerings and equally light demand. Tees are offered at \$26 @ \$26.50, and Double Heads at \$27 @ \$27.50.

**Crop Ends.**—A sale is reported at something less than \$22.50, free on cars Jersey City.

**Scrap Iron.**—Is somewhat more active, and really choice qualities command somewhat better prices. For ordinary lots, \$26 @ \$27.50 may be quoted, and for choice Rail-way Scrap, \$28 @ \$29 has been paid.

**Nails.**—Are scarce and very firmly held at \$3.35, net, with prospects of an early advance on this quotation.

An amalgamation has been made by two well-known firms in Philadelphia, as will be seen by reference to the announcement in our special advertisement columns. Messrs. Shimer & Co., formerly at 250 South Third street, have become associated with Messrs. L. & R. Wister, and will continue business at 230 South Fourth street under the firm name of L. & R. Wister & Co.

#### PITTSBURGH.

Office of *The Iron Age*, 77 Fourth Avenue, Pittsburgh, Pa., June 13, 1882.

We are near the close of the second week since the inauguration of the great iron lock-out, and the termination is apparently no nearer now than it was when it commenced; both the manufacturers and ironworkers are confident of carrying their point, but it is very evident that one or the other will be disappointed. It is certain, however, that the manufacturers thus far have displayed more stamina than ever before under similar circumstances, and the outside public have more confidence in them in consequence.

The starting up of the Cincinnati mills yesterday was generally expected, and the fact that the workers resumed work under the contract of October last, is regarded as a weakening of the Amalgamated Association, although they could not honorably do otherwise, as their demands at Cincinnati were a plain violation of contract.

The Superior mill is still being run by non-union men, and it is the intention of Laumann & Co., to start up their mill at Apollo to-morrow with non-union workers. There is talk about starting up other mills in the same manner, but it is not probable that any special effort will be made in that direction for the present, and, in addition, they are not inclined to import skilled labor from other points, and will not do it unless forced to it, which is not the case at present.

**Pig Iron.**—Business continues very dull, and we cannot look for any improvement while the mills are all idle. A great many furnaces have blown out within the past week, and others will do likewise very soon. It is estimated that furnaces here and at points tributary to this market, representing a capacity of 3500 to 3700 tons per day, have blown out. It is evidently the intention of furnace men to keep stocks down in first hands, and thereby prevent the market from becoming demoralized. Mill Irons nominally unchanged at \$23 @ \$24, 4 mos. Small sales of Foundry Iron at \$23.50 @ \$24, 4 mos., for No. 2, and \$25 @ \$26 for No. 1. Small sale of Cold-blast Charcoal at \$38, cash.

**Muck Bar.**—Like Forge Iron, is not wanted, and in the absence of sales there is no established price. It is possible, in the event of more of the mills starting up with non-union men, that there will be some Muck wanted, as it is not likely that mill owners would care to start up their puddling furnaces with green men when they can obtain Muck Bar ready to their hand.

**Manufactured Iron.**—It is difficult to give accurate quotations in the present condition of the market; as a rule, manufacturers are still supplying the immediate wants of customers at card rates, but with transient buyers we have heard of prices quoted considerably above the card, the object of the seller being to scare the buyer off. Some few of the mills have fair stocks, but they are the exception, not the rule, and they are all anxious to make them hold out as long as possible. The starting up of the Cincinnati mills will relieve the wants of Western buyers somewhat, and if the strike holds out any length of time a good many Western orders will, no doubt, find their way eastward. Card rates remain unchanged at 2,50¢ for Bars; 3,30¢ for Tank; 4,30¢ for Sheet, and 5,30¢ for Boiler Plate. Large quantities of Skelp Iron could be sold, but it is an article that is not kept in stock. Some of our boiler makers will be obliged to stop soon for want of Boiler Plate.

**Nails.**—There is a good deal of inquiry, with the stock of home made about exhausted, and some of our manufacturers are buying Eastern Nails to put in on Western contracts. Prices are very firm and tending upward; small orders are being filled at \$3.40 @ \$3.50, 60 days, 2% off for cash; it is simply impossible to place large orders, and transient buyers have but little show in getting small orders placed. We hear of a lot of 100 kegs, bought at Wheeling on Pittsburgh account, at \$3.40 per keg there, usual terms, making them cost about \$3.50 delivered here.

**Wrought Iron Pipe.**—There is a continued fair business and like other iron products, large orders have to be refused. Prices firm, but unchanged, discounts on Gas and Steam Pipe, 60 @ 62½%, on Boiler Tubes, 42½ @ 45%. Oil-Well Casing 67½ @ 70¢ per foot, net, do. Tubing, 20¢, net.

**Rails, &c.**—Steel Rails are quoted, nominally, at \$48 @ \$50, cash, delivered free on cars in Pittsburgh. There is considerable inquiry for track supplies, very little of which are kept in stock. Prices firmer, but without quatabl<sup>e</sup> change: Railway Spikes, 3¢ @ 3.15¢, 30 days; Splice Bars, 2.50¢ @ 2.60¢; Track Bolts, 3.65¢ @ 3.75¢ with square, and 3.85¢ @ 4¢ with hexagon, nuts.

**Old Rails.**—Last sales reported were at \$28 for Tees, and \$30 for Double Heads, delivered in Pittsburgh.

**Steel.**—Business is only fair, not what would be generally expected in view of the Iron lockout. Prices unchanged. Best brands of Refined Cast Steel, 12¢; ditto Crucible Machinery, 7½¢; ditto Plow Steel, in slabs, 8½¢; Boiler Plate, 6¢ @ 6½¢. We are cognizant of boiler makers who had contracted for iron boilers, and being unable, on account of the strike, to get Boiler Iron, are using Steel in place.

**Scrap.**—There is so little doing that it is difficult to give quotations. Old Car Wheels are offered at \$27 @ \$28, 7 gross; Cast Turnings are still quoted nominally at \$15 @ \$16, gross; Wrought Scrap, \$28 @ \$29, 7 net ton; Wrought Turnings, \$21 @ \$22, net; Old Car Springs and Axles, \$35 @ \$38.

**Window Glass.**—This important interest continues slow for the season, but an improvement in the near future is looked for. No change in card or discounts.

**Coke.**—The Iron strike has commenced to affect the Coke trade, and while prices remain unchanged, the tendency is toward lower figures. We continue to quote in a regular way at \$1.50 per ton, delivered free on cars at ovens, and \$1.75 for small foundry ovens.

**Coal.**—There have been no Coal shipments by river for several days, the water having got down too low, and Coal operators generally would like to have it stay down until fall, in order to get stocks reduced in the down-river markets.

**Petroleum.**—This important interest continues very much depressed, owing to continued overproduction, with but little prospect of any immediate change for the better. Sold yesterday down to 52½¢ per barrel at wells.

#### CHICAGO.

Office of *The Iron Age*, 36 and 38 Clark Street, cor. Lake Street, Chicago, June 12, 1882.

**Hardware.**—The hardware trade indicates no change from our previous report; market firm and demand fairly active.

**Manufactured Iron.**—The stocks of regular size are rapidly diminishing and quotations given are held very firmly. We quote: Bar, 3¢; Angle, 4¢; T, 4½¢; Beams and Channels, 4½¢ @ 4½¢; Hoop at 4¢; Sheet, Plate and Tank, 10 to 14 gauge, 4¢; 15 to 17 ditto, 4.30¢; 18 to 21 ditto, 4.60¢; 22 to 24 ditto, 4.80¢; 25 to 26 ditto, 5¢; and 27 ditto, 5.20¢. Patent Cold-rolled Shafting, 20¢; Norway Iron, Original Bars, 5¢ rates; Norway Iron, re-rolled, 6¢ rates; Ulster Iron, 4½¢ rates; Low Moor Iron, 8¢ rates; Nuts and Washers, 7½¢ off list; Wrought Boat Spikes, 3½¢ rates.

**Steel.**—The Steel market is moderately fair, while quotations are firm; otherwise we have no change to note. We quote: Tool, 12¢; Machinery, O. H., 5½¢; Crucible Machinery, 7¢; Hammer, 2 inches and under, 8¢; over 2 inches, 9¢; Cast Spring, 7¢, and O. H. Spring, Tiro and Sleigh Shoe, 5¢. Sheet, first, second and third quality, 12¢, 10½¢ and 8½¢, respectively; Crucible Plow, 6½¢; Eagle Plow, 5½¢; Iron Center Plow, 10½¢; and soft Steel Center Plow, 10½¢.

**Pig Iron.**—The market generally indicates a quiet tendency, orders for future delivery being light, both as to number and tonnage. A considerable decline is to be noted in quotations on the softer grades of Iron, which have been weak for some time, while the supply of Scotch (imported) is limited, and quotations are accordingly held very firm. We quote as follows: Lake Superior Charcoal, Nos. 1 and 2, \$28.50; No. 3, \$29, and Nos. 4, 5 and 6, \$30 @ \$31; Calumet, \$27.50 @ \$28; Silver Soft, \$24 @ \$26; Crane, No. 1, \$28; No. 2, \$27; Thomas, \$28.50 @ \$29.50; Imported Scotch, \$28 @ \$29, and American Scotch, \$26 @ \$28.

**Scrap Iron.**—Market still continues to be dull and weak. We quote (dealers' purchasing prices, which are nominal): No. 1 Wrought Scrap, \$21, net ton; No. 1 Railroad Scrap, \$22 @ \$23; ditto Heavy Cast, \$18; ditto Stove Plate, \$12; ditto Cast-Iron Borings, \$8 @ \$9, and ditto Machine Shop Turnings, \$11 @ \$12.

#### CHATTANOOGA.

Office of *The Iron Age*, Market and 8th Sts., Chattanooga, June 12, 1882.

The market for heavy material in this district shows no change worth noting since our last report. Crude articles are unsteady, and holders in a waiting attitude. Finished articles continue strong at last quotations. The probabilities still are that production of raw material will be materially curtailed during the summer. The weather has been intensely hot during the latter days of the week; the nights continue cool.

**Pig Iron.**—The Pig Iron market is unsettled and unsatisfactory. Some of our oldest masters confidently expect a cessation of the strike within 30 days, and predict that general resumption North would send Iron up, and hold it strong until the end of the year. Several furnaces will blow out for repairs. Some that are out and being repaired will not be hurried into blast unless a change of status occurs in the Pittsburgh and Northwestern districts. Car-wheel Metals are nominal at quotations. There is slight inquiry for them and no pressure to sell. We quote: No. 1 Foundry, \$24 @ \$25; No. 2 Foundry, \$22 @ \$23; Gray Forge, \$20 @ \$21; White and Mottled, \$19 @ \$20; Carbon Wheel Metal, \$33 @ \$37.

**Ores.**—Tennessee River Ores, fossiliferous, which run about 50%, are placed on cars in Chattanooga at \$2 @ \$2.16. Brown Hematite, 7¢ ton is worth \$2.25 @ \$3, as per quality.

**Miscellaneous Articles.**—Old Rails, \$29, and rather slow; Scraps dull; Wrought \$20 @ \$21; Cast Scrap, \$13 @ \$15; Old Wheels, \$28 @ \$29.

**Manufactured Iron.**—Bar is strong at \$2.50 rates for large lots. Mills are running full. Track supplies are also stiff at last figures, and scarce. Railroad Spikes, \$3.40; Track Bolts, \$4; Fish Plate, \$3.

**Coal.**—Fancy Lump, \$3; Common, \$2; Run of Mine, \$1.75 at mills.

**Coke.**—Furnace Coke, \$3 at point of consumption; Foundry, 10¢ @ 12¢ per bushel.

**Steel and Iron Rails.**—Steel we quote at \$50 @ \$55; Iron, nominal, \$46; Small T, \$50 @ \$52.

#### LOUISVILLE.

W. B. BELKNAP & CO., Iron and Steel Merchants, Nos. 117 and 121 West Main street, report to us as follows, under date of June 10: The market for Finished Iron has been extremely active, and prices are actually \$3 @ \$5 per ton higher than in May. Fortunately, however, there has been little immediate necessity to provide for, and, as we are promised that the Cincinnati mills shall start in a few days, fears of a famine are averted. Orders for Plates and Angles have gone East for the past 10 days. Light Sheet has proved very sensitive, and advanced \$6 @ \$8 per ton. Nails have been in a measure the object of speculation, and price has run up 30¢ per keg; they may now be quoted \$3.40 @ \$3.50. Fair weather has greatly improved trade prospects, and business is fair for this time of the year.

**COAL.**—The market for Coal has commenced to affect the Coke trade, and while prices remain unchanged, the tendency is toward lower figures. We continue to quote in a regular way at \$1.50 per ton, delivered free on cars at ovens, and \$1.75 for small foundry ovens.

**Scrap.**—There is so little doing that it is difficult to give quotations. Old Car Wheels are offered at \$27 @ \$28, 7 gross; Cast Turnings are still quoted nominally at \$15 @ \$16, gross; Wrought Scrap, \$28 @ \$29, 7 net ton; Wrought Turnings, \$21 @ \$22, net; Old Car Springs and Axles, \$35 @ \$38.

**Window Glass.**—This important interest continues slow for the season, but an improvement in the near future is looked for. No change in card or discounts.

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**Steel.**—The market for Steel has been extremely active, and prices are actually \$3 @ \$5 per ton higher than in May. Fortunately, however, there has been little immediate necessity to provide for, and, as we are promised that the Cincinnati mills shall start in a few days, fears of a famine are averted. Orders for Plates and Angles have gone East for the past 10 days. Light Sheet has proved very sensitive, and advanced \$6 @ \$8 per ton. Nails have been in a measure the object of speculation, and price has run up 30¢ per keg; they may now be quoted \$3.40 @ \$3.50. Fair weather has greatly improved trade prospects, and business is fair for this time of the year.

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**Scrap.**—There is so little

Stocks are being slowly lessened and the market is smaller.

## SCOTCH PIG IRON

has been steady since I last wrote, but there have been no important variations in prices, either as regards warrants or makers' iron. The most hopeful feature in connection with this class of crude iron is the large local consumption of No. 3, which fact is understood to have enabled makers to reduce their stocks to the extent of 3000 to 4000 tons. To the same cause is doubtless attributable the very light additions made to Connal's stores of late, last week's increase there having been about 800 tons only. Shipments are above last year's totals, the comparative increase to date having been 40,458 tons, on a total of 240,350 tons this year. The furnaces blowing number 109 (including 8 on hematites), as against 121 last year. The stock in Connal's stores is 637,085 tons, compared with 559,742 tons a year ago. Imports from Middlesbrough to Scotland are on a small scale, the difference in prices being too small to promote its sale. Writing from Glasgow, on May 24, when the market closed for the holidays, James Watson & Co. said: "Since Friday last the market has been comparatively quiet, no special feature of interest having occurred. The demand for makers' iron is still good, and prices are well sustained. The Middlesbrough ironmasters still adhere firmly to 43/6 as the quotation for No. 3, and second-hand parcels are changing hands at 43/3 per ton. On account of the Queen's birthday and Whitestone holidays intervening, no market will be held between to-day and Tuesday next. On Monday last the market opened at 47/8 and declined to 47/4, closing at 47/4½ per ton. Yesterday the price rallied from 47/4 to 47/7½, closing at 47/5½ per ton. To-day a fair business was done from 47/4½ to 47/3, closing with buyers at the latter figure, sellers asking 47/3½ per ton. The shipments last week were 12,122 tons, as compared with 9532 tons for the corresponding week of last year." We quote:

No. 1.	No. 3.
G. M. B., at Glasgow	47/6
Clyde,	50/6
Coltress,	52/6
Langlochan,	52/6
Gartsherrie,	52/3
Summerlee,	53/3
Calder,	50/6
Carbroe,	49/6
Glenrothes, at Ardrrossan	48/6
Edison,	48/6
Darnellington,	48/6
Shotts, at Leith	52/6
Kinsell, at Bo'ness	47/6
Caron, at Grangemouth	48/6

John E. Swan & Bros., Limited, and William Colvin & Co. quote similar prices.

## CLEVELAND PIG IRON

has gained somewhat in tone during the past week or so, and at date the quotations of the "bears" approximate more closely with those of the "bulls," or producers, than they have done for a long time past. Makers firmly adhere to 43/6 for No. 3, and the merchants have grown to regard 43/ as a better level than 42/6 to 42/9. The local consumption is very good and shipments are quite up to the average—perhaps rather more. All the Northern works are busy except the heavy foundries, which are duller than for some years past. Makers' prices for G. M. B., net cash, f. o. b. at makers' wharves in the Tees, are:

No. 1 Foundry	Mottled	42/6
" 2 "	White	42/6
" 3 "	Refined Metal	62/6
" 4 "	Kentledge	42/6
" 5 "		42/6

Bolckows last week sent off a cargo of 900 tons steel railway blooms from West Hartlepool to Baltimore. The Eston Works have had a slight strike of mechanics, but the difficulty was only temporary and the works are well engaged.

## WEST COAST HEMATITES

are quiet, and have not grown much firmer, notwithstanding the fact that most of the parcels lately pressed by second holders have been cleared off. Makers are endeavoring to proceed cautiously by declining to sell far ahead, and their policy in this respect is likely to be confirmed by the reported slight improvement in the rail trade, together with the probability of some of the furnaces in Scotland and Cleveland being taken off hematites and run on ordinary iron. Mixed lots may be quoted 52/6 at 53/6, and makers' brands, for moderate lots, as under:

No. 1.	No. 2.	No. 3.
Gleator	64/	63/
Lonsdale	53/	54/
Washington	53/	53/
West Cumberland	53/	53/
Lowther	53/	53/
More Bay	55/	54/
Distington	55/	53/
Harrington	55/	54/
Solway	55/	54/
Maryport	55/	54/

Last week's shipments were 12,636 tons of hematite pigs and 7118 tons of rails and blooms.

## BELGIAN IRON IN ENGLAND

The Corporation of Birmingham have just given out specifications containing a singular condition—one which savors, indeed, of a certain amount of claptrap. The corporation needed a quantity of ironwork for certain new buildings they have in hand. Included in this were girders, joists, columns, &c. These articles, as you may possibly be aware, are largely used in this country, and latterly they have been almost exclusively supplied by the Belgian or Westphalian producers, who have laid themselves out for the trade, and send us rolled girders of lengths, &c., which our makers cannot, or all events do not, turn out. The Birmingham authorities specified that no Belgian iron must be supplied by the person or firm securing the contract to which I have alluded. This condition has been joyfully paraded as a proof of the superior wisdom of the Birmingham corporate sages, and hailed as a return to common sense. If any substantial objection could be urged against Belgian iron of this class I might be disposed to join in the chorus, but in the absence of any valid reason in that direction I am disposed to regard the step with suspicion. Birmingham is a Radical town and the seat of the English "caucus." Its civic rulers appear to be "playing to the gods" in this matter in order to extend their hold upon the masses, who are easily caught with chaff of this sort. What is most surprising is the direct violation of the Radical principle of buying in the

cheapest market, no matter where that market may be!

## WAGES SLIDING SCALES.

In view of the extreme likelihood of a big dispute among your ironworkers being in existence when this reaches you, I append selected extracts with which I have been favored from the award (recently delivered) of Sir J. W. Pease, who was selected to arbitrate between the ironmasters of the North of England and their men, who had struck against the incidence of the sliding scale. The arbitrator wrote, *inter alia*: "I may perhaps be allowed to make a few observations consequent upon what has been laid before me. I do so, thinking it is almost necessary that those who are primarily affected by such an award should have before them the leading facts which have to be taken into consideration before it can be made. Just in proportion as the facts are understood, provided they have been rightly weighed by the arbitrator, will be the satisfaction with which his award will be received and acted upon. It was urged before me with considerable force by the operatives, that the sliding scale just suspended had not given satisfaction, as it dealt with the question of the value of their labor as if it always bore a certain fixed relative position to the price of iron; that contingencies in trade did arise, and that they had now arisen, when labor, being scarce in the market, was dearer, and should be purchased at a relatively higher price. They also alleged that neither did it follow necessarily that the other items in the cost of manufactured iron were subject to the same conditions as when the scale was arranged. They also averred that the employers, in their treatment of the labor question, had at times taken advantage of the state of that market to reduce the price of labor when it was redundant, without having that regard to the price of the article produced which is involved in adhering for guidance entirely to a sliding scale. It also appeared during the inquiry (and this supports such an argument) that certain allowances, under the name of 'prize money' and 'Monday working money,' which were freely given during times of scarcity in the labor market, were immediately withdrawn by certain employers as soon as the condition of the labor market enabled them to do so, without regard to the sliding scale. These items were so obviously items affecting the payment of labor, that during our sittings they were, by unanimous consent, admitted as payments, and placed under the control of your association for the future."

On the other hand, it was alleged by the employers that no better standard existed of the value of labor in the market than the price of the article produced, especially when, by mutual arrangement, the question of the value of labor was dealt with in so wholesale a manner as it is by such associations as yours—that the very fact of a sliding scale involved the acknowledgment of the principle—that as the article manufactured advanced in price by the action of the laws of supply and demand, so would the desire to create the profitable article occasion a greater demand for, and a consequent improved price for, the labor which produced it, and that thus the scale produced by its gradations the correct figure for the payment of the item of labor. That if even there was a temporary scarcity of labor, the fact of higher prices soon produced an abundant supply by the return of old hands into the trade, and the education of new ones. \* \* \* It is impossible to eliminate from the consideration of the prices to be paid to the operatives the price received by the employers for the article the operatives produce. Indeed, the most perfect form of co-operation of labor and capital that we can conceive must be primarily based upon such a consideration. The sliding scale, which, it was admitted, was eagerly welcomed by both parties in 1880, and which the operatives allege, has broken down, appears to have given dissatisfaction to the operatives, not because the main principle was wrong, but because the details of the arrangement require further adjustment to fit them to times of an ultra-ordinary character. It is unfortunate, in some respects, that the ship plates form so large a portion of the articles on the sale price of which the item of wages is based. These are necessarily sold considerably in advance. The ship owner contracts for his vessel, the shipbuilder purchases the needed plates for a long forward delivery, and so, in a rising market, the selling price of the day, as in this instance, must be considerably above the deliveries on which wages have been based.

"It is evident that, as wages, almost necessarily, are based upon the experience of the past, anomalies are produced, sometimes in favor of the employers, sometimes of the operatives. These anomalies are most glaring when the market has fluctuated with rapidity; the shorter the periods between the ascertainment of prices and the settlement of wages the less will these anomalies be apparent. \* \* \* The figures which have been admitted at various arbitrations show that taking 1/ in the £1 on the realized prices as the primary basis for wages, the sum paid in excess of that figure between the end of 1874 and the beginning of 1882 has varied between qd, 1/1, 1/3, 1/6 and 1/9 £ ton. There is but one exception to these figures during a period of seven years, during which the realized price varied between a maximum of £8. 14/3. 09 to a minimum of £5. 3/3. 12 £ ton. This exception was December 22, 1879, when the employers conceded 12½ per cent. (or 1/3), making the figure 3/ above the 1/ in the £1 on the realized prices. This was done with a quickly rising market, and during the time of excitement caused by the great demand for iron from America, and conditional also on the acceptance of a two years' sliding scale, which was to place this figure at 1/6 in the £1 on the realized prices, for two years from May 1, 1880. Including this exception, the average paid over 1/ in the £1 on the realized prices over a period of seven years will be about 1/4 £ ton.

"I am aware that in 1868, 1869, 1870 and 1871, we had prices varying from £6. 5/ to £7. 2/ £ ton, with a rate for puddling varying from 1/9 to 2/6 above 1/ in the £1 on the realized prices. I am also well aware the price of manufactured iron advanced rapidly from the end of 1872 to the middle

of 1874, during the period of inflation which ultimately proved so prejudicial to both employers and operatives throughout the North of England, the price of iron being from £10. 5/ to £12 £ ton, and the margin above 1/ in the £1 on the realized prices was considerably above any previous or later figure, reaching 4/ £ ton; but these prices can have but little bearing on the £5. 10/ to £7 realized prices of this day. The conclusion, therefore, may be safely drawn that the principle of the sliding scale now in suspense has been the general rule of your decision for the past seven years, and that arrangements and awards have only varied the 1/6 above the 1/ in the £1 on the realized prices, as settled by Mr. Dale on the 23d of April, 1880, from qd. as minimum to 1/9 as a maximum—Mr. Shaw Lefevre having directed that the award should have before the leading facts which have to be taken into consideration before it can be made. Just in proportion as the facts are understood, provided they have been rightly weighed by the arbitrator, will be the satisfaction with which his award will be received and acted upon.

ELECTRIC LIGHTING

continues to engross a great deal of public attention, particularly from that section of the British public which is interested in the shares of the numerous companies formed within the past month or two. Additional ventures of this class appear almost daily, and the shares are as eagerly taken up as ever. The aggregated capital of these concerns must now reach many millions sterling. Every leading system has its company, and some have many sub-companies formed for working the particular light in different parts of England and abroad. The parent company sells concessions to its progeny, and they in turn grant permits to their offspring, so that the demand for either Pig or finished will revive much before the middle of August next. In Bohemia, old rails and scrap sold to a considerable extent during the week, while in Hungary comparatively little transpired therein. We quote to-day: Common Pig, 52/5 floris £ ton at the furnaces; Gray ditto, 55/5 56/5, and Bessemer, 58/5 59/5. Sheets for locksmiths, 12/125; Bohemian, 12/125; ditto for roofing, 18/195; ditto for boilers, 17/185; ditto for tanks, 16/170; and beams, 12/130. The active demand for sheets continues unabated. Developments which are to grow out of the opening of the St. Gotthard tunnel and the greater activity in trade between Rhenish Westphalia and Northern Italy will be watched with great interest by coal producers and the iron trade, &c., in Austria. Competition between the Mold, Cenit, St. Gotthard and Brenner transit lines will be great, eventually leading, no doubt, to very low freight unless competing railroads come to an understanding among each other. At any rate great changes in the currents of trade seem inevitable, and it is to be hoped that Austrian producers may not be the losers by it in the long run. During the week under review Metals have undergone no change. We therefore do not repeat the quotations given in our last, which remain unchanged.

other hand good commands are still received for hoop and car wheels. Our car and locomotive builders, the latter in part are still busy, but of bridge makers only a few have been favored with large orders latterly; most of them for a year past are insufficiently occupied. Foundries might be busier, but machinists and boiler makers are tolerably well engaged. Coal meanwhile continues to rise, and next forward more is asked for future, but I presume producers will be content if they can maintain the present price. The Mark Railroad is in treaty for its future supply. Metals cannot be called active, but they suffice great stiffness. Lead is firm, English Pig at 16/16. 50; ditto Sheet, 16. 50/17; German Pig, 14. 50/15, and Spanish, 18/18. 40. Copper is held higher; we quote Drontheim, 72/73; Electrolytic, 70/77, and English Refined Ingots, 72/74. Tin is sustained, we quote Banca and English, 50/50; Australian, 100/107. Speier remains without anything doing, 17. 50 marks 50 kg.

## (Cologne Gazette.)

DUSSELDORF, May 20, 1882.—Iron.—In this vicinity the tendency of Pig Iron gradually improves, but this is not the case with Steel. Little change is reported from the Moselle and Sarre districts. The Fig and Finschel Iron sell with great ease. Luxembourg, it seems, is to have its first steel works. Metz & Co., of Elie, intend buying extensive iron mines at Dudelange, where they will erect four blast furnaces and a Thomas steel works. The Upper Silesian Iron market still remains in good position. And Puddling Pig is quite stiff. Out of 55 coke blast furnaces 34 are blown in. Merchant Iron continues to look up, and Sheets are very active at firm rates. Coal is dull there, except nut and small.

## HOLLAND.

## (Koch &amp; Vlierboom.)

ROTTERDAM, May 23, 1882.—Tin.—Our market is excessively quiet at 50.25 guilders 50 kg. on the spot, and 59.75 to arrive, both nominally.

## AUSTRIA.

## (Austrian Trade Journal.)

VIENNA, May 25, 1882.—Iron.—The general situation has been subject to little change since last report. There is not much probability that the demand for either Pig or finished will revive much before the middle of August next. In Bohemia, old rails and scrap sold to a considerable extent during the week, while in Hungary comparatively little transpired therein. We quote to-day: Common Pig, 52/5 floris £ ton at the furnaces; Gray ditto, 55/5 56/5, and Bessemer, 58/5 59/5. Sheets for locksmiths, 12/125; Bohemian, 12/125; ditto for roofing, 18/195; ditto for boilers, 17/185; ditto for tanks, 16/170; and beams, 12/130. The active demand for sheets continues unabated. Developments which are to grow out of the opening of the St. Gotthard tunnel and the greater activity in trade between Rhenish Westphalia and Northern Italy will be watched with great interest by coal producers and the iron trade, &c., in Austria. Competition between the Mold, Cenit, St. Gotthard and Brenner transit lines will be great, eventually leading, no doubt, to very low freight unless competing railroads come to an understanding among each other. At any rate great changes in the currents of trade seem inevitable, and it is to be hoped that Austrian producers may not be the losers by it in the long run. During the week under review Metals have undergone no change. We therefore do not repeat the quotations given in our last, which remain unchanged.

## EAST INDIES.

## (Hessenauer &amp; Co.)

COLOMBO, May 2, 1882.—Plumbago.—The market has been quiet; dealers are willing sellers at a reduction. We quote in rupees, £ ton: Fine Lump, 150/160; Ordinary ditto, 130/140; Chippa, 70/75; and Dust, 47.50/52.50. Ship-bulk Colombo Ores, 17.50/18.50. Gold, 500/500. Billiton, 266.75; Straits and Australia, 265.50; English, 257.50. Sheet, 25/26, and Speier, 44/45. Iron.—The lower duties on Belgian and German Iron have had no effect on prices in France so far, and some time will pass ere they will, for the demand for public works is such that the domestic product does not feel foreign competition in the Ardenne, there is no change; they quote Coke Merchant, 19.50 francs 700 kg. In the Paris market, Merchant Coal, 19.50 francs 21/21.50 orders being plentiful. Wire Nails, N. A. N., are worth 20/20. In the Loire and Rhone Basins, Steel works, machinists and most other makers are as active as they can be. The demand for Foundry Pig at Longwy in the Meurthe and Moselle district remains brisk at 8.50/8.40, while Puddling Pig is worth 7.20/7.50 francs. As for the North, prices are fully sustained at Maubeuge on the late meeting of dealers, and can only be affected by the Ardenne. The quote Merchant Iron, 20.50/21.50, T. Iron 21/21.50. Sheets, 21.50/22.50 according to thickness. Some Paris workmen at the foundries having attempted to inaugurate a strike, have been sent back to where they came from. At Paris, Charleroi offers Merchant Iron at 19.50, and Flooring tiles at 20.50; Grenelle, nevertheless, still obtains 21 francs. The project of an elevated railway in this city, if carried out, will give considerable jobs to the local workmen. Coal—is pretty much stationary at present: inland navigation to be closed for the summer, is very active. Stocks in the Loire Basin are quite light.

## BELGIUM.

## (Moniteur Industriel.)

BRUSSELS, May 29, 1882.—Iron.—The market here has been better held during the week; the improvement is nothing very great, yet the situation appears more hopeful. In finished Iron some considerable decrease is to be expected for export. The quote Merchant Iron, 20.50/21.50, T. Iron 21/21.50. Sheets, 21.50/22.50 according to thickness. Some Paris workmen at the foundries having attempted to inaugurate a strike, have been sent back to where they came from. At Paris, Charler

## GRIFFIN'S PATENT SCROLL SAW BLADES. NEW AMERICAN INDUSTRY.

The trade may be interested to know the history of the celebrated Griffin Scroll Saw Blades. About four years ago Mr. Griffin, an enterprising machinist in New Hampshire, became interested in scroll sawing. Having occasion to use the regular Paris saw blade, the idea occurred to him, "Why cannot I make a better blade?" He thought about it, and after nearly a year's experimenting he produced and patented the best scroll saw blade ever made.

Their popularity has grown each year, so that they now have a national reputation. At first the trade were slow to take hold of the Griffin blades, but they soon saw that they must keep them, as the boys always called for the Griffin blades, and wouldn't take any other kind. Very few of the foreign blades are now imported into this country, and those are now giving way to the Griffin blades. The following letter (and we have received many of the same character) will explain why these Griffin blades are so popular:

Richmond, Ky., April, 1881.—

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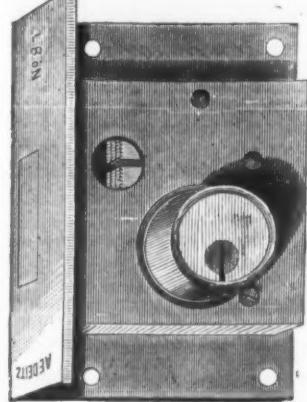
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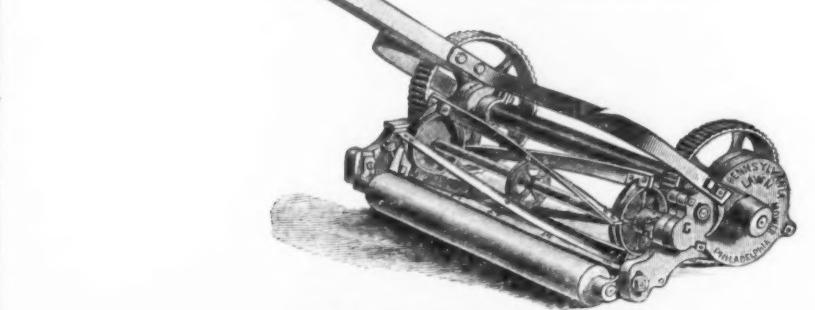


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**The Swedish Iron Market.**—According to recent reports it appears that the iron trade in Sweden presents but few interesting features, the market being quiet and dull, and few sales transpiring in the various departments. The supply is said to be too great and a reduction of the manufacture appears to be in urgent demand. Within late years India has become a large consumer of Swedish iron, the amounts shipped during the years 1878, 1879 and 1880 being 19,680, 10,273 and 10,312 tons respectively. Although the shipments during 1880 only slightly exceeded those of the previous year, the difference will appear important when the considerable increase in the price during the latter year are taken into consideration. Iron says that as an improved feature in the Indian market as regards Swedish iron, it may be stated that buyers have of late shown less disinclination to purchase rolled iron, which class of iron they have for years entertained a strong prejudice against purchasing. Formerly, it appears, no certificate of whatever nature would convince the buyer that iron offered for sale was really of Swedish manufacture without the dents on the bars from the hammer being visible, and, in consequence, only forged iron was saleable, all other kinds, as for instance rolled iron, being believed to be of German, Belgian or English manufacture. A difference, but which is only believed to be transitory, is, however, still maintained in the price of these two kinds of iron, but buyers are clearly beginning to understand that there is really no difference whatever in their quality.

**The Iron and Metal Exchange.**—At a meeting of the Board of Managers of the Iron and Metal Exchange, on Saturday, the following standing committees were appointed: Executive—Messrs. Delafield, White, Flynn. Finance—Messrs. Mayer, Gerry, Leman. Complaint—Messrs. Hill, Snow, Rogers. Floor—Messrs. Rogers, Leman, White. Information—Messrs. Mayer, Hill, Shriner. Statistics—Messrs. J. A. Flynn, Mendel. Warehouse—Messrs. Robinson, Leman, Gerry, Delafield. Trade—Messrs. Leman, Mayer, John E. White, Libbald, Marval. Mr. E. J. Shriner was appointed secretary and acting superintendent.

An exchange states that St. Isaac's, the great cathedral at St. Petersburg, which was finished in 1859 and cost some \$25,000,000, is slowly sinking into the ground, and the authorities do not know how to stop it. The Russian capital is built upon a marsh, and the site of St. Isaac's is on one of its softest parts. Over \$1,000,000 was spent in driving piles originally, but the building has never been firm, and now threatens to topple over at one corner. A recent examination showed that on one side the columns had separated from the architrave, leaving a space of 3 inches between. The roof was at once lightened by removing large stones, but new fissures appeared as the work went on, the workmen left in fear, and the engineers gave up the job as a bad one. Since then nothing has been done except to hold consultations and reject unpractical plans for saving the building.

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Employing none but the best of help in our business, we can confidently assure our customers that their interests will be promptly and faithfully attended to.

#### WE MANUFACTURE A PATENT SPRING PISTON PACKING,

which has been in use for some 13 years past, giving the best satisfaction. We make and furnish the Elliptic Spring when desired. Customers having Cylinders Rebored, who desire now Pistons or Piston-Rings, would do well to send direct to us. We send competent men to take dimensions and make Pistons just prior to boring, so that they can be put in when the boring is done, saving in this way considerable valuable time. We have on hand 80 different sizes of PISTON-RINGS AND PISTON-HEAD PATTERNS. Also, ALL SIZES OF CORLISS VALVE PATTERNS. All work guaranteed. Illustrated circulars sent on application.

### THE L. B. FLANDERS MACHINE WORKS,

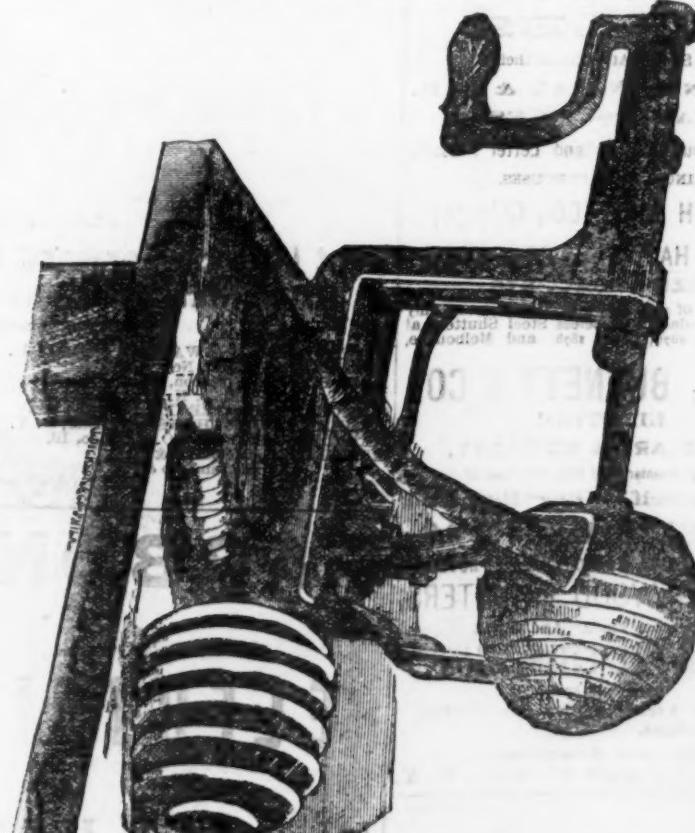
1025 Hamilton Street, PHILADELPHIA, PA.

D. W. PEDRICK.

H. C. AYER.

### PENN HARDWARE CO.'S "IMPROVED PENN" 1882

### APPLE PARER, CORER AND SLICER.



Patented April 1st, 1882.

Far Ahead of Any Apple Paring Machine now Made.

You can with ONE HAND pare, core and slice an Apple and withdraw the Fork from the core all ready for another Apple. This is what no other MACHINE will do. Requires but one hand to work it.

DOES THE WORK QUICKEST AND BETTER THAN ANY OTHER MACHINE.

MANUFACTURED BY THE

**PENN HARDWARE COMPANY, READING, PA.**



Our specialty Also, Creations, Finials and Vanes, Stable Fixtures, Hitching Posts, Door and Window Guards, Wrought-Iron Gratings, Fire Escapes and Ladders, Jails, &c. Our Fencing can be shipped to any part of the United States, and can be set up by the purchaser at small expense. Our prices are reasonable. Correspondence and notice of public lettings of ironwork solicited. Every Hardware Dealer should have our Catalogue. Address CLEVELAND WROUGHT IRON FENCE WORKS, Office, 21 Water Street, near Union Depot, CLEVELAND, OHIO.

### E. C. ATKINS & CO.



SPECIALTY:  
LARGE CIRCULAR SAWS.

SOLE MANUFACTURERS  
OF THE GENUINE  
SILVER STEEL DIAMOND X CUT SAW

INDIANAPOLIS, IND.

ANDOVER CHILL IRON for Car-wheels, Chilled Rolls, &c. Each pig of this iron is marked exact chill depth,  $\frac{1}{2}$  inch to  $\frac{3}{4}$  inch, and so guaranteed. Standard A. Whitney & Sons' Chill Cup.

ANDOVER GRAY FORGE FOR BEST MILL PRODUCTS. F. A. COMLEY, Secretary and Treasurer.

J. WESELY PULLMAN, Agent. Office and selling Agency, 407 Walnut street, Philadelphia.

Office and Works, 204, 206 & 208 Chicago St., BUFFALO, N. Y.

WILLIAMS, WHITE & CO., MOLINE, ILLINOIS.

MANUFACTURERS OF

DROP HAMMERS, HORIZONTAL PRESSES FOR BENDING IRON,

GANG BORING MACHINES, TOOLS FOR PLOW MAKERS,

THE JUSTICE HAMMER.

Send for Circulars.

THE "EDDY" STRAIGHTWAY VALVES.  
ALSO,  
FIRE HYDRANTS.  
Axe, Hatchet, Powder and  
Brush Machinery.  
THE EDDY VALVE COMPANY,  
WATERFORD, N. Y.  
BENTON, FAULKNER & BIRD, N. Y. Agents  
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H. B. SMITH MACHINE CO.  
925 MARKET ST.  
PHILADELPHIA  
CELEBRATED  
WOOD WORKING  
MACHINERY  
For Car Shops, Planing Mills, &c.  
Also Machinery for all purposes. Correspond with us

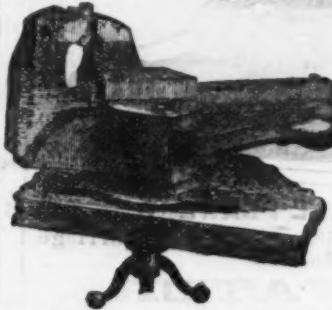
### FROM THE

### London Iron Trade Exchange,

SATURDAY, MAY 20, 1882.

"We have received from Messrs. Merchant & Co., of Philadelphia, a well-known house in the tin plate and metal trades, a copy of a list of makers' brands of tin plates which they have just issued for the guidance of buyers. The brands are alphabetically arranged under the heads of "charcoal" and "coke," and all private brands and those supplied by makers to one customer only, have been carefully excluded. The result is that the list contains only those brands whose makers are known, so that any defect in quality or packing can be traced to the proper works, and the brand would naturally be avoided in future. Mr. Clarke Merchant was over here a few months since, and devoted much time to the compilation of the information contained in the list which has now been issued by his firm. Knowing what an outcry there has been in the States against the private brand system, we feel sure the outcome of Mr. Merchant's visit will be much appreciated by buyers of tin plates in America."

### STEPHENS PATENT VISE.



The most durable, and the only solid quick-working Vise, with automatic taper jaw attachment.

Will very soon pay for itself, in saving of time and labor.

For sale by the trade.

OFFICE:

41 Dey St., New York, U. S. A.

### The Humane Calf Weaner



The Perfect Hog Ring and Stock Mark.

One instrument does for both purposes. The only Ring that fits the joint outside and makes a lock joint. The Humane Calf Weaner is as easy on a calf's head as a halter and as sure to stay. Samples and descriptive circulars furnished.

J. H. BROWN & CO., Mrs. Hardware Specialists, OTTAWA, ILL.

### NOTICE.

Gentlemen:

We refer you to our advertisement in the issue of June 8th. There will only be two more like it, one July 6th and one August 3d, for the Sheet Iron business will not stand any such expense long, as you know; therefore, look at them carefully, pick out the kinds of Hods and Shovels you want and forward your order before they are all gone. We have a large stock now and can fill all orders promptly, but if the strike lasts it will be impossible to get iron at any price; therefore send on your orders early, for those that come first will be first served.

### IRON CLAD MFG. CO.,

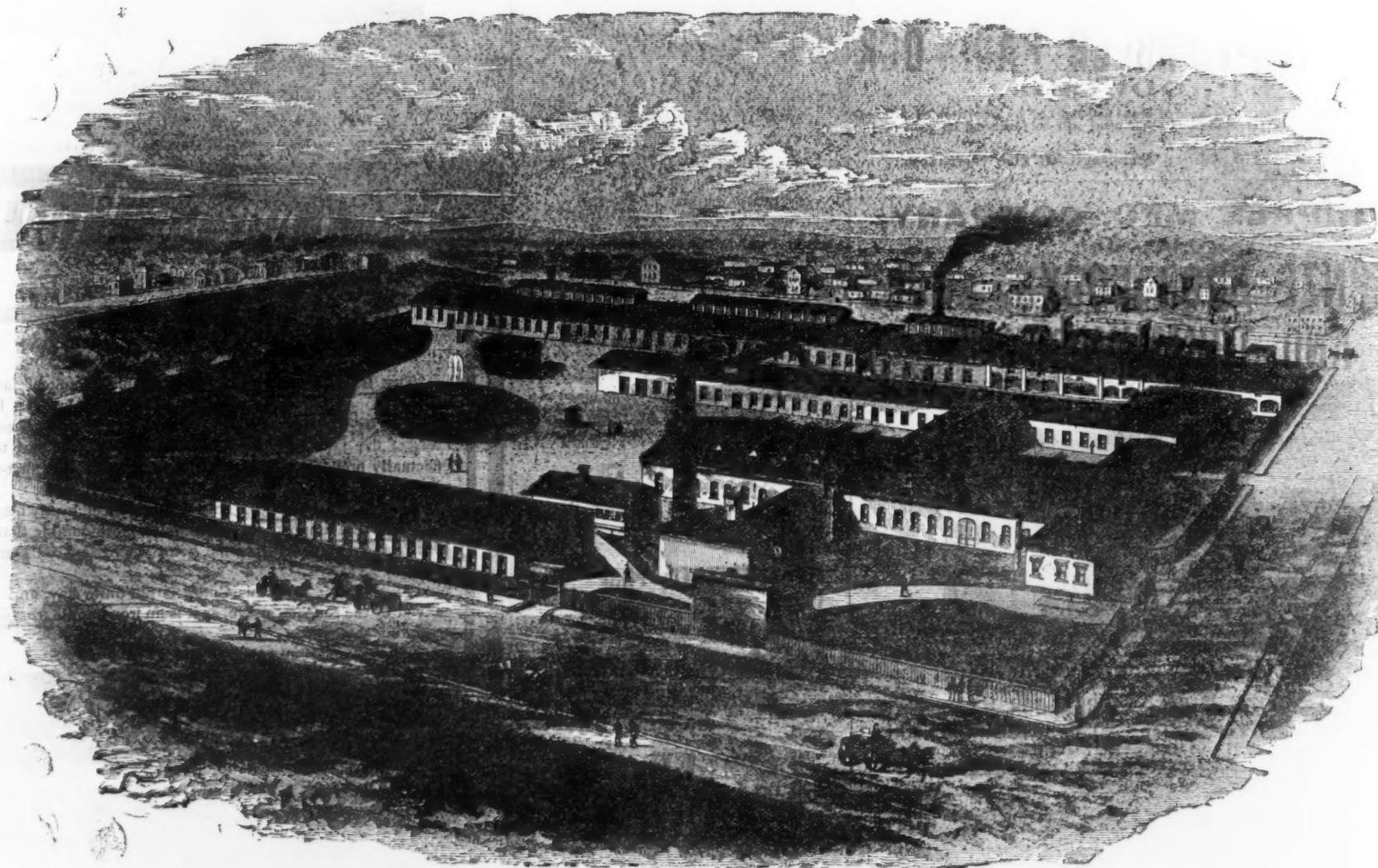
22 Cliff Street, NEW YORK.

# NEW AMERICAN FILE CO.,

PAWTUCKET, R. I.

MANUFACTURERS OF

# FILES AND RASPS.



1882.

## PERUSE. PONDER. PURCHASE. PROFIT.

(Read the two issues next preceding.)

After four months' **TRIAL** of the **COMPARATIVE** worth of their own and several leading Brands of Files [**MILLS AND FLATS,**] the above Company are **HAPPY** to say said tests have resulted in **PROVING** their Files **SUPERIOR** by from **TEN** to **FIFTY** per cent. Not that every File is **SUPERIOR** to anything that is **MADE**, but the Tests by **MACHINERY**, "which are void of prejudice," **SHOW THEIR FILES** to be uniformly worth from Ten to **FIFTY** per cent. **MORE** than other Brands of Files in the **MARKET**.

The **EXPERIENCE** of years in the advantage of every **FACILITY**, the employment of the **BEST MATERIAL**, "they use nothing but the best **CRUCIBLE CAST STEEL**,"—"no Open Hearth"—the constant **TESTING** of the comparative worth of their own with other Brands, the **ENDEAVOR TO BE AHEAD**, the not being satisfied with "**GOOD ENOUGH**," the employment of the first and **BEST MACHINE** for cutting good Files ("Bernot,") and one which they claim **HAS BEEN INFRINGED** by about every machine **ADOPTED** for cutting files, all combine to make as they **JUSTLY CLAIM**, the **BEST FILE** in the market, and worth certainly Ten per cent. more **TO ANY CONSUMER**.

**AXIOM.—QUALITY** will win.

**SEE NEXT ISSUE.**

**THE EAGLE LOCK CO.,**  
TERRYVILLE, CONN.,  
MAKE



**THE ONLY PIN-TUMBLER PAD LOCK  
EVER PRODUCED.**

It is self-locking and perfectly secure. It is made of brass and finished by our patented process. This above cut represents the only size yet made, but other sizes will be furnished as soon as the requirements of the trade are known.

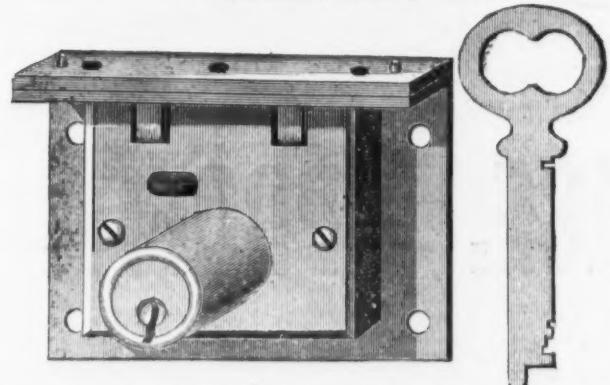
For Sale by Hardware Jobbers Throughout the Country.

**THE WHIPPLE MFG. COMPANY,  
CLEVELAND, OHIO.**  
**FINE BRONZE DOOR LOCKS, KNOBS  
AND TRIMMINGS.**



REAL BRONZE BUTTS, STORE DOOR HANDLES with  
ORNAMENTAL BRONZE FRONT LOCK AND LATCH,  
And a general line of  
BUILDERS' HARDWARE.

**THE CHARLES PARKER CO.,  
MERIDEN, CONN.,**



**MANUFACTURERS OF CABINET LOCKS.**

The "Challenge" Lawn Mower Sharpener.

A NEW and much needed article,  
and adjustable to any Lawn  
Mower made.

SIMPLE AND RELIABLE!  
CHEAP AND DURABLE!

Per doz. \$12.00. Discount to the Trade.

EVERY DEALER SHOULD HAVE THEM  
IN STOCK.

For Sale by the Trade Generally.

**THE CHALLENGE MFG. CO.,  
PLAINFIELD, N. J.**

HORACE F. SISE, Agent, 100 Chambers St., N. Y.

Patent Applied for.

ALL MAKES OF  
**BARBED FENCE WIRE,**  
Stretchers, Diggers, Staples, &c. And  
**LOWE'S METALLIC PAINT,**  
The Great Railroad Paint.

CHARLES E. McBRIDE, Eastern Agent, 197 Pearl Street, New York. Also, Boston, Philadelphia and Baltimore.

John T. Lewis & Bros.  
No. 231 South Front St.,  
PHILADELPHIA.



MANUFACTURERS OF  
Pure White Lead, Red Lead, Litharge,  
Orange Mineral, Linseed Oil,  
AND PAINTERS' COLORS.

**Brooklyn White Lead Co.**



White Lead, Red Lead & Litharge.  
No. 182 Front Street,  
NEW YORK.

**JOHN JEWETT & SONS,**  
Manufacturers of the well-known brand of  
**WHITE LEAD.**



ALSO MANUFACTURERS OF  
**LINSEED OIL.**  
181 Front Street, NEW YORK.



The Atlantic White Lead and  
Linseed Oil Co.,  
Manufacturers of

White Lead (Atlantic), Red Lead, Litharge,  
Glass Makers' Litharge and  
Orange Mineral;

**LINSEED OIL,**  
Raw, Refined and Boiled.

**ROBERT COLGATE & CO.,**  
287 Pearl St., NEW YORK.

**SALEM LEAD COMPANY,**  
COPRODUCERS AND MANUFACTURERS OF  
**PURE WHITE LEAD.**



ALSO MANUFACTURERS OF  
Lead Pipe and Narrow Sheet Lead.  
F. A. BROWN, Treas. SALEM, MASS.



**LEVER**  
Lemon Squeezer,  
With perforated strainer. It  
will squeeze one-third more  
juice from a lemon than any  
other, also quicker.

R. Onderdonk.

**SCOTT MANUFACTURING CO.,**  
BALTIMORE, MD.,  
SOLE PATENTEES AND MANUFACTURERS.



Enlarged and improved. Is the  
only successful Parer with a quick  
return movement of the knife. All  
the wheels have square holes and  
shafts with square ends, so they can-  
not work loose.



**UNIVERSAL CAN OPENER.**  
SOLID CAST-STEEL SHANK AND KNIFE.  
Adjustable to cans of any shape and size. Also,  
Patent Pea Asorting Machines For Packers Use  
Patent Peach Pitting Machines  
Also Manufacturers of Medallion and Victoria Egg Beaters.

**The "Eureka" Pipe Cutter**

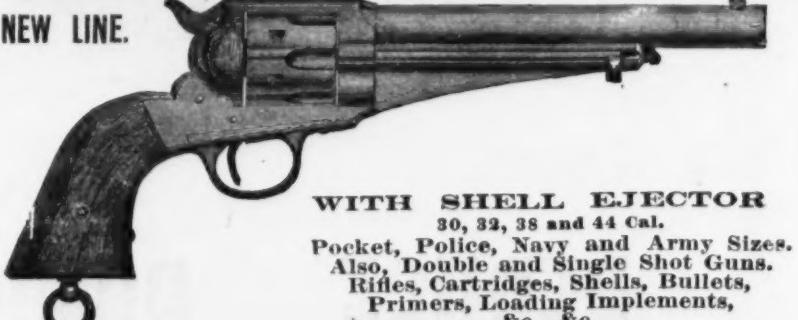
**THE BODY**—is fitted with an adjustable Cast-Steel Jaw at the point where it comes in contact with the Pipe, which Jaw can be renewed at any time by simply removing one screw. By this system the wearing away of the Jaw (which in other cutters is the first part to give out) is effectually prevented, and this tool can be kept in first-class order at all times.

**THE WHEEL BLOCK**.—This is also of Steel, neatly fitted to its socket, and cannot be dropped out. It is much more durable than the cast-iron blocks and is hardened at the point where the rod comes in contact with it.

**THE HANDLE**—of this Cutter is put on to stay, and cannot be removed by the roughest usage, as it is an iron handle, cast fast to the Rod, operating the block.

—MANUFACTURED BY—

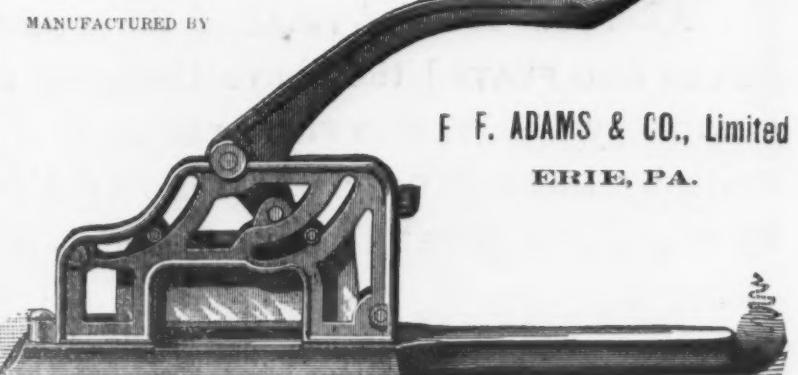
**Pancoast and Maule** { 243 & 245  
SOUTH THIRD STREET  
PHILADA.



WITH SHELL EJECTOR  
30, 32, 38 and 44 Cal.  
Pocket, Police, Navy and Army Sizes.  
Also, Double and Single Shot Guns.  
Rifles, Cartridges, Shells, Bullets,  
Primers, Loading Implements,  
&c., &c.

Send for reduced catalogue and discounts of goods manufactured by

**E. REMINGTON & SONS,**  
233 Broadway, NEW YORK.  
**ACME TOBACCO CUTTER, No. 10.**



**GREATEST ROCK BREAKER  
ON EARTH.**  
CAPACITY A TON A MINUTE.  
DON'T FORGET IT.  
Guaranteed to do Double the Work of  
any other or Money Refunded.

SEND FOR CIRCULARS.  
ALSO,  
Engines, Boilers, Stamp Mills and  
Mining Machinery.

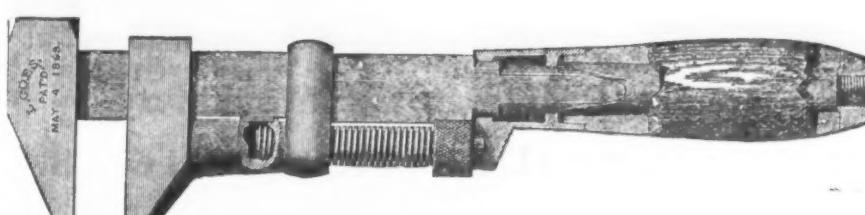
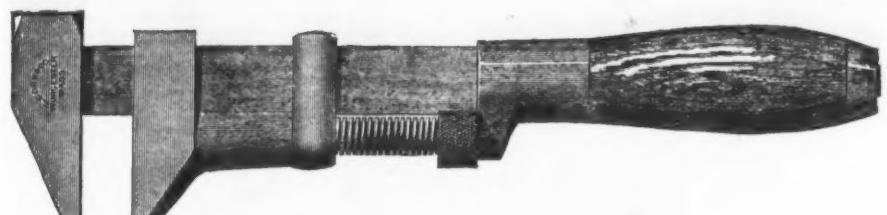
**GATES & SCOVILLE  
IRON WORKS.**  
52 Canal St., Chicago.

**L. COES & CO.,**

MANUFACTURERS OF THE

# ORIGINAL GENUINE IMPROVED PATENT SCREW WRENCHES.

ESTABLISHED 1839.



We discarded the old Nut attachment nearly two years ago and applied the better device we are now using (covered by patent) for preventing the back thrust of the ferrule. The superiority of this invention over all others has been fully established by practical test. By reference to above cut (sectional view) our improved method will be readily understood.

We make the shank of our wrench about double the size of those in other screw wrenches, leaving it full size, and strength by not cutting a thread.

Our Ferrules are made with two bearings, both fitting the shank.

An Iron Tube of sufficient strength to resist any pressure that may be put upon it, is fitted to the shank, one end resting against the lower bearing in the ferrule, the other against the enlarged Tip or Nut at end of handle, all rigidly held in position, the wooden handle made to fit exactly over the Iron Tube, forming a solid combination of Wood and Iron, preventing any possible displacement of the ferrule from hard usage. All our Wrenches are made with straight Bar, full size, the extreme length. The Jaw is made with ribs on the inside, running full length of the Jaw, which, in connection with the projecting sides, both secured by patent, are fully equal to any strain the Bar may be subjected to. We have also enlarged the barrel of the Jaw to take a larger and longer screw, enabling our Wrench to accommodate a larger Nut than any other manufactured. We make our goods of the very best material, thoroughly case-harden, and warrant every Wrench.

Manufactory at WORCESTER, MASS. Warehouse, 97 Chambers and 81 Reade Streets, NEW YORK.

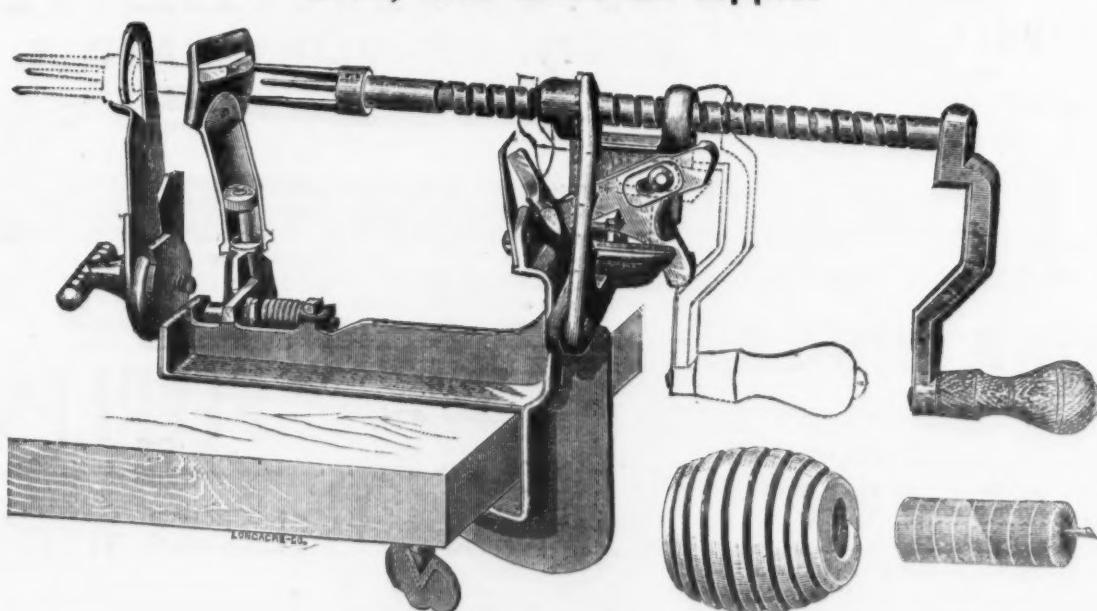
**DURRIE & McCARTY, Sole Agents.**

## ADVANCE APPLE PARER, CORER, AND SLICER

OF 1882.

Patented October 19, 1875, and Patents Pending.

The Only Machine ever Invented that will Entirely Pare, Core, and Slice an Apple.



With one hand you can Pare, Core and Slice an Apple and withdraw the Fork from the Core.

MANUFACTURED BY THE

**READING HARDWARE CO., READING, PA.**

**Wyoming Shovel Works,**  
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Patent Plain Back Solid Shovels and Spades, Back Strap Shovels,  
Spades and Scoops.  
RAILROAD AND MINERS' SHOVELS of Superior Quality a Specialty.

PAYNE PETTEBONE & SON.

Send for Price List, &c.

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Manufacturer of  
Sprout's Double and  
Single Shear  
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And  
Sprout's  
HAY ELEVATORS,  
PULLEYS and  
GRAPPLERS.  
Send for Circular.  
Muncy, Lycoming Co., Pa.

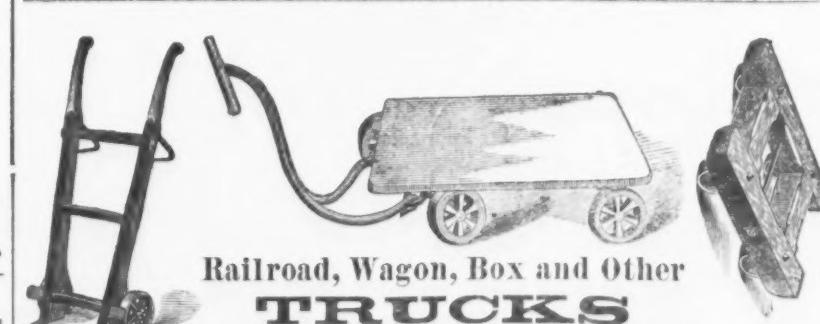
**TRUCKS**  
Made in all Varieties and Sizes.  
Timber Well Seasoned, Well Ironed and Substantially Framed.

Please send for Prices and Sample Orders. A trial will secure your custom.

Price Lists of Scales and Testing Machines furnished free upon application.

**RIEHLÉ BROS.** Store, 4th abv. Chestnut,  
Works, 9th abv. Master, PHILA.

N. B.—Tests of materials made daily at our works, and certificates furnished. Reports copied and kept confidential.





Issues Policies of Insurance after a careful inspection of the Boilers  
COVERING ALL LOSS OR DAMAGE TO  
Boilers, Buildings and Machinery,  
ARISING FROM  
**STEAM BOILER EXPLOSIONS.**

The Business of the Company includes all kinds of Steam Boilers.  
Full information concerning the plan of the Company's operations can be obtained at the  
COMPANY'S OFFICE, HARTFORD, CONN.,  
or at any agency.

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STANDARD KELLY WIRE, BARS AT 5 INCH SPACES.

**THE OLD RELIABLE  
KELLY STEEL BARB WIRE!  
IS THE BEST.**

We do not sell to jobbers, and want but ONE RELIABLE DEALER in each town. Correspondence solicited. Prices, samples, etc., sent on application.

**THORN WIRE HEDGE CO., Sole Mfrs.,  
15 to 21 N. Clinton Street, Chicago, Ill.**

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(LICENSED UNDER ALL BARBED WIRE PATENTS),**

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**FOUR-POINTED BARBED WIRE FENCING.**



CABLES AND BARBS, WARRANTED ALL STEEL.  
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52, 54, 56, 58 & 60 New Street.  
CINCINNATI, OHIO.  
C. W. COLE, Sec'y.

LICENSED MANUFACTURERS OF

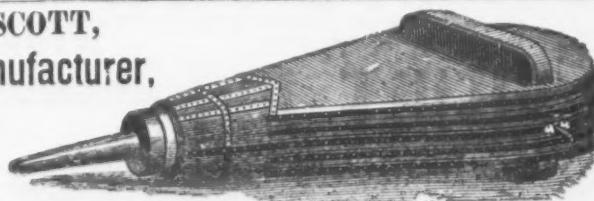
**FOUR-POINTED BARBED WIRE FENCING.**  
We have large stock of Galvanized, Red and Brown Painted Barbed Wire on hand, and can fill all orders  
promptly. Send for sample and prices.

**CLEVELAND BARB FENCE CO.,  
39 & 41 CENTRE ST.  
CLEVELAND,  
OHIO.**

LICENSED.

**TWO & FOUR POINTED  
Barbed Wire Fencing.**

**GEO. M. SCOTT,  
Bellows Manufacturer,  
Johnson Street,  
Cor. 22d St.,  
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**B. KREISCHER & SONS,  
FIRE BRICK.**

BEST AND CHEAPEST.

Established 1845.  
Office, foot of Houston Street, East River,  
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**NEWTON & CO.,**

*ALBANY, N. Y., Manufacturers of*

**FIRE BRICK**

**Stove Linings,**

**Range and Heater Linings.**

\* Cylinder Brick, &c., &c.

English, Scotch and Welsh

**FIRE BRICKS,**  
Dinas and Silien Bricks

for Glass and Steel Works.

**S. A. RIMINGTON,**  
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**And Furnace Blocks**

**DRAIN PIPE & LAND TILE.**

Woodbridge, - - - N. J.

**BORGNER & O'BRIEN,**

Manufacturers

**FIRE BRICK**

AND  
Edge Pressed Furnace Blocks,

**LAY RETORTS, TILES, &c.,**  
Twenty-third Street,  
above Race, PHILADELPHIA.

Twenty years' practical Experience.

**WATSON FIRE BRICK CO.,**

ESTABLISHED 1856.

Successors to JOHN R. WATSON, Perth Amboy, New Jersey

Manufacturers of

**FIRE BRICK,**

FOR ROLLING MILLS, BLAST FURNACES, FOUNDRIES, GAS WORKS, LIME KILNS, TANNERMES, BOILER AND GRATE SETTING, GLASS WORKS, &c.

**HENRY MAURER,**

Proprietor of the  
**Excelsior Fire Brick & Clay**

Retort Works,

Manufacturers of FIRE BRICK, HOLLOW

BRICK AND CLAY RETORTS,

WORKS: PERTH AMBOY, NEW JERSEY

Office & Depot 418 to 422 East 23d St., N. Y.

**TROY FIRE BRICK WORKS,**

Troy, N. Y., JAMES OSTRANDER & SON,

ESTABLISHED 1848, Manufacturers of

**FIRE BRICK,**

Tuyeres, Tiles, Blast Furnace Blocks, &c. Miners and

Miners in Woodbridge Fire Clay and Sand, and Bister

(and Kaolin).

Established 1864.

**GARDNER BROTHERS,**

Manufacturers of

**STANDARD SAVAGE FIRE BRICK,**

**TILE & FURNACE BLOCKS,**

OF ALL STANDARD SIZES.

Clay Gas Retorts and Retort Settings, and

Miners and Shippers of Fire Clay.

OFFICE: 115 Smithfield St., Pittsburgh, Pa.

WORKS: Mt. Savage Junction, Md., and Lockhart, Pa.

Patented April 11th, 1862.

**HALL & SONS,**

**FIRE BRICK,**

Buffalo, N. Y.

**CHAS. D. COLSON,**

**FIRE BRICK,**

Foundry Facings Sand, Tools and Supplies.

CHICAGO, ILL.

Please mention this paper.

**UNION MINING COMPANY,**

**Mount Savage Fire Brick.**

EDWARD J. ETTING Agent,

230 South Third St., Philadelphia, Pa.

**MILLER'S BRICK PRESSES**

Established 1844.

**FIRE AND RED BRICK.**

And Brickmakers' Tools in General.

SAMI. P. MILLER & SON,

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CUTTERS WILL NOT BREAK.

THE DERBY BIT CO.

ANSONIA, CONN.

Not Complicated.

DURABLE, STRONG, CONVENIENT.

**American Bolt and Screw Case Co.,**

Successors to W. R. Baker & Co.

DAYTON, OHIO.

Send for Illustrated Price List.

MANUFACTURERS OF  
REVOLVING BOLT AND SCREW CASES.



We take pleasure in informing the trade that we are sole owners of the Patents and Manufacture of the latest and most improved Bolt and Screw Cases. Dealers have long since felt the need of a Bolt and Screw Case that would answer the purpose for which it was intended. We feel that our Revolving Case is able to supply this want in our Revolving Cases. Iron cases with dozen or more revolving shelves have been patented and put upon the market as long ago as 1871, but owing to their intricate construction, as well as the inconvenience of getting out of order, necessitated the invention of a more practical case. Our Patents are of a recent date and the cases are strictly draw cases, provided with steel shelves, so that the contents of the case cannot be easily disturbed. The numbers of bolts and screws handsomely printed on the fronts of the drawers present a highly ornamental appearance on the front of the case. The arrangement is such that no effort is required to find any number, as the entire case revolves, and the selection can be made instantly, while in revolving shelf cases only one shelf can be operated at the time. In our Revolving Case, one shelf must first be put in proper position before any compartment can be got at in the shelf below; besides the numbers are mainly on this side of the case opposite to those parts operating, and when once taken out it difficult to know which shelf contains the number you wish to get at. Besides in shelf cases the screws often interfere with the revolving of the shelves, when the case must be stopped again to prevent the shelves from moving the shelf. For further particulars we refer you to the following first-class houses that handle our cases exclusively:

**PRINCIPAL AGENTS.**  
LLOYD, SUPPLIES & WALTON, Phila.  
A. F. SHELDON & CO., NEW YORK.  
W. C. CO., St. Louis.  
BINDLEY HARDWARE CO., Pittsburgh.  
SAMUEL G. B. COOK & CO., Baltimore.  
L. C. DEPARTMENT & SONS, Davenport, Ia.  
J. C. FRAZER & CO., Boston.  
DUCHARMER, FLETCHER & CO., Detroit.  
HUNTINGTON, HOPKINS & CO., San Francisco.  
HENDERSON, SPENCER, BARTLETT & CO., Chicago.  
MARKEY, ALLING & CO., Chicago.  
HOWELL, GANO & CO., Cincinnati.  
PRATT & CO., Buffalo.  
HALL & HAMBURG, Hamburg.  
HALL & WILLIS HDW. CO., Kansas City.  
WYETH HDW. & MFG. CO., St. Joseph, Mo.  
SEEBERGER, BREKEY & CO., Chicago.

WESTPHAL'S PAT. INDEPENDENT REVOLVING SHELVES

AND

**SELF-LOCKING SCREW CASE.**

Made from the Best Gray, Malleable and Sheet Iron.

This is not a Drawer Case. This Structure has been purposely invented on account of trouble caused by a Drawer.

The Standard of This Case is a Hollow Cone, Firm as a Rock, on Which all Shelves Revolve.

Every shelf locks itself; only one compartment is accessible, and nobody can take out screws except the person behind the counter. The glass fronts are held and guarded by iron frames, so that the dealer can see through all compartments at a glance; if any number is out, can fill, at the same time enabling the customer to see what he wants, which is impossible with all drawer cases. Anything made of wood we all know is not lasting and will shrink and work to pieces very quickly, particularly an angular Drawer, working from side to side and from end to end under the heavy weight of Screws or Bolts within. Any one shelf of our case would carry even as if loaded all around. Furthermore, we guarantee our case for 5 years, and if not found superior to any case now offered to the trade, after trial, can be returned at our expense and we will refund the money.

**HENRY WESTPHAL,**

MANUFACTURER,

86 Market St., CHICAGO, ILL.

**V. G. HUNDLEY,**  
PROPRIETOR OF  
**NORTH CAROLINA HANDLE CO.,**



MANUFACTURER OF  
**Handles and Spokes,**

19 Beale Street and 97 Chambers Street, NEW YORK

HARDWARE COMMISSION MERCHANT.

**"PEERLESS"**

**CLOTHES WRINGERS.**

Sold by the Jobbing Trade

Everywhere.

**THE SIMPSON AND GAULT MFG. CO., Cincinnati, O.**

**L. F. BLUE, General Agent.**

**WOODLAND FIRE BRICK CO., LIMITED,**

Woodland, Clearfield Co., Pa.,

MANUFACTURERS OF  
"WOODLAND" BRAND FOR STEEL FURNACES OF ALL KINDS, BLAST FURNACES AND  
MALLEABLE IRON WORKS.

"BRADFORD" Brand for Rolling Mills, Glass Houses, &c.

"W. F. B." Brand for Hot Blast Stoves, Stocks, Cupolas

# **The Iron Age Directory**

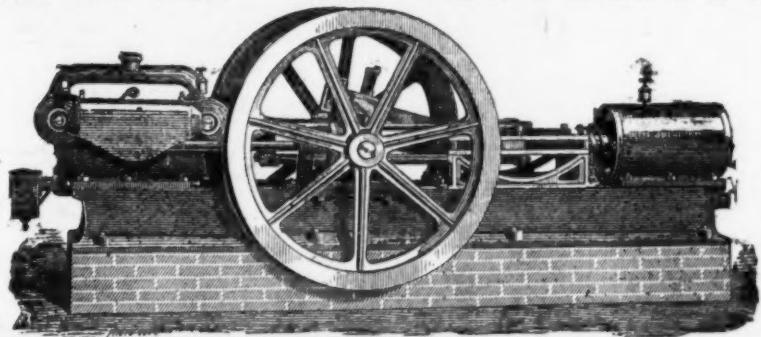
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## and Index to Advertisements.





## IMPROVED AIR COMPRESSOR!



MANUFACTURED BY THE  
MORRIS COUNTY MACHINE & IRON CO.  
DOVER, N. J.

Has positive moving Rotary Valves. Will give better results than any compressor built at the present time, which can be authenticated by parties now using them. They are also used to drive pumps in deep mines. With forty pounds of steam will give fifty pounds air pressure. Send for descriptive circular.



**PRENTISS' PAT. VISSES,**  
Adjustable Jaw.  
Stationary or Pat. Swivel Bottoms.  
ADAPTED TO ALL KINDS OF VISE WORK. ALSO  
"PEERLESS" SWIVEL PIPE GRIP,  
FITS ANY VISE. SOLD BY THE TRADE.  
**PRENTISS VISE CO.,**  
93 Dey Street, New York.  
SOLE PROPRIETORS. SEND FOR CIRCULAR.

**THE STANLEY WORKS,**  
MANUFACTURERS OF  
**Wrought Iron Butts, Hinges**  
AND  
**DOOR BOLTS,**  
Plain, Japanned, Bronzed and Plated.  
**FACTORIES:** New Britain, Connecticut. **WAREHOUSE:** 79 Chambers St., New York.

**RHODE ISLAND HORSE SHOE CO.,**  
MANUFACTURERS OF  
Horse, Mule & Snow Shoes of the Perkins Pattern.  
Works at Valley Falls, R. I. Office, 31 Exchange Place, Providence, R. I.  
F. W. CARPENTER, President. C. H. PERKINS, Gen'l Manager. R. W. COMSTOCK, Secretary

**Bemis & Call Hardware & Tool Co.**  
  
**PATENT COMBINATION WRENCH.**  
These wrenches are made from the best of Wrought Iron, with Steel Head and Jaw, case-hardened throughout, and not only combine all of the superior qualities of our Cylinder or Gas Pipe Wrenches, but also all the requisite Combinations of a regular Nut Wrench thus making a combination which has no equal.  
For Circulars and Price List, address  
**BEMIS & CALL HARDWARE & TOOL CO., Springfield, Mass.**

## Terry's WROUGHT Iron



The **BEST**  
Hanger and Rail  
in the market.  
Will not break;  
cannot get off the  
track.

As cheap as the  
best cast iron.

B

## BARN DOOR HANGER & RAIL

Snow and Ice  
cannot lodge on  
the Rail.

Writ for Circulars.

HENRY B. NEWHALL is Agent  
for our Hangers in New York City.

**TERRY MFG. CO.,** Dundee, N. Y.

**CLARK MFG. CO.** MANUFACTURERS OF  
BUILDERS' HARDWARE  
BUFFALO, N.Y.

### CHAMPION

### HOG RINGER

### RINGS AND HOLDER.

Only double ring ever  
invented. The only  
ring that will effectively  
keep Hogs from  
rooting. No sharp  
points in the nose.

Rings 75c. Rings, 50c. 100c.  
Holders, 75c. Huskers, 15c.

CHAMBERS, BERRING & QUINLAN, Exclusive Manufacturers, Decatur, Ill.

### EAGLE BILL

### CORN HUSKER

### RINGS AND HOLDER.

Or the single ring in  
the market, which  
is the best Husker in  
the market. Farmers say it  
is the best. Use no other.

Rings 75c. Rings, 50c. 100c.  
Holders, 75c. Huskers, 15c.

CHAMBERS, BERRING & QUINLAN, Exclusive Manufacturers, Decatur, Ill.

### BROWN'S

### HOG AND PIG

### RINGER AND RINGS.

Or the single ring in  
the market, which  
is the best. No sharp  
points in the nose to keep it  
sore.

Ringers 75c. Rings, 50c. 100c.  
Holders, 75c. Huskers, 15c.

CHAMBERS, BERRING & QUINLAN, Exclusive Manufacturers, Decatur, Ill.

**BUTLER & COLDEY MFG. CO., Limited,**  
MANUFACTURERS OF  
Hardware and Machinist Tools,  
Factory, ARLINGTON, N. J. P. O. Box 1909. Office, 97 Chambers St., NEW YORK

## WROUGHT IRON STAPLES.

All kinds of Merchant Staples kept in Stock, and Special Staples for  
any purpose made to order by

**WHEELING HINGE CO.,** Wheeling, W. Va.

## GUN POWDER.

**Laflin & Rand Powder Co.,**

No. 99 Murray Street, New York,  
Manufacture and sell the following celebrated brands  
of Sporting Powder known everywhere as

### ORANGE LIGHTNING,

### ORANGE DUCKING,

### ORANGE RIFLE

more popular than any Powder now in use.

Blasting Powder and Electrical Blasting  
Apparatus.

Military Powder on hand and made to order.

SAFETY FUSE, FRICTIONAL & PLATINUM  
FUSES.

Pamphlets showing sizes of grain sent free.

## Mineral Wool.



A fibrous material, enclosing about 90 per  
cent. of its volume of air, and therefore a  
superior

## NON-CONDUCTOR

## OF HEAT AND SOUND.

Being made from the slag of blast furnaces,  
it is fire-proof and durable in contact with  
heated surfaces. Readily applied.

Ordinary Grade, 24 lbs. per cubic foot.

Extra Grade, 14 lbs. per cubic foot.

Circular and Sample free by mail.

**U. S. MINERAL WOOL CO.,**

16 Cortland St., New York.

**WITHEROW & GORDON,**

Engineers & Contractors

PITTSBURGH, PA.

Agents for the

## WHITWELL HOT BLAST STOVES.

OVER 600 IN USE.

The following parties either have been in  
under construction.

Cedar Point Iron Co., N. Y.

Duluth Furnace Co., Pa.

Crane Iron Co., Pa.

Pennsylvania Steel Co., Pa.

E. H. Coleman, Boston, Pa.

Chase Furnace Mill Co., Pa.

Davenport, Fairbank & Co., Pa.

Isabella Furnace Co., Pa.

Paxton Furnace Co., Pa.

Shaw Furnace Co., Pa.

China Iron Works, Ohio.

Milton Coal and Iron Co., Ohio.

Winona Furnace Co., Ohio.

Moore & Moore, Toledo, Ohio.

Conwell & Sons, Ohio.

Hocking Valley Iron Co., Ohio.

Cleveland Rolling Mill Co., Ohio.

Meyer Iron Co., Ill.

Union Iron and Steel Co., Ill.

Meiss & Culbertson, Ky.

Aspinwall Furnace Co., Ky.

Foxton Furnace Co., Tenn.

Southern States Co., Tenn.

Sewanee Furnace Co., Tenn.

James C. Warner, Rising Jaws, Ga.

Ohio Iron Co., Zanesville, O.

Niles Furnace Co., Ala.



## THE MORGAN VARIABLE BLAST TUYERE IRON

With the front plate removed, showing the Rotating Air Tubes by which four different sized currents of air may be directed, and the plates to fit  
into the iron tube. We also furnish an attachment  
by which we make a narrow fire long or short. This  
Tuyere Saves Half the Coal, makes a clean fire,  
gives a center blast, and directs just the amount of  
heat where it is wanted to go.

We also furnish a Water Tuyere (see advertisement  
in first issue of this month) that keeps fire-bed cool,  
prevents Tuyere from burning, and gives all the hot  
water wanted.

All Tuyeres guaranteed to please or no sale.

Special inducement to the trade. Catalogues sent  
free. Address

**A. W. MORGAN & CO.,**

52 VANCE BLOCK,

INDIANAPOLIS, IND.

550 A DAY GUARANTEED

THIS AUGER MAKES  
WELL SET

DIA. - IN -

16 FT. PER HOUR.

SEND FOR CATALOGUE.

**A. W. MORGAN & CO.**

INDIANAPOLIS, INDIANA.

W. W. CULBERTSON,  
President.

W. M. NEHRING,  
Superintendent.

A. FLUMMER, Sec'y, Treas. and Gen'l Manager.

THE

QUEEN CITY MALLEABLE IRON CO.,

Make all Shapes and Sizes of

Malleable Iron Castings

KNOWN to the trade. Our specialty is

WELDING MALLEABLE CASTINGS.

Guaranteed to weld perfectly and capable of being  
driven under a hammer. Address,

N. W. COR. VINE AND SECOND STS.,

WORKS, 585 & 587 EASTERN AVE.,

CINCINNATI.

A. F. PIKE.

Pike Station, N. H.

Manufacturer and Wholesale Dealer in

BLUESTONE

For Scythes, Axes, Knives and Turpentine Hacks.

Factories at Pike Station, N. H., and Evansville & Westmore, Vt.

Indian Port (End),

White Mountain,

Letolite, Hucker,

White Grit,

The New Boss,

Lumolite, Hugo,

Willoughby Grit,

Green Mountain,

Black Diamond,

Mowing Machine,

German Pattern,

Chocolate, Ax Grits,

Stones made, labeled and branded in any style de-

sired. PRICE AND QUANTITY GUARANTEED. All the above

brands are of clear, even grit and will not glaze.

474 & 478 ATLANTIC AVE., BOSTON, MASS.

LOMBARD & CO.,

Importers and Dealers in all kinds of

GRINDSTONES,

Cor. Lewis Wharf & Atlantic

## New York Wholesale Prices, June 14, 1882.

## HARDWARE.

Hazer Straps.	dis 6@ 5c
Genius Emerson.	dis 20@ 25c
Badger's Emerson.	dis 20@ 25c
Badger's Patent.	dis 20@ 25c
Hunt's.	dis 20@ 25c
Chapman.	dis 20@ 25c
Saunders'.	dis 20@ 25c
Torrey's.	dis 20@ 25c
Hivets.	dis 20@ 25c
Iron and Tinned, new list, Dec. 10, 1881.	dis 20@ 25c
In bulk, new list, Dec. 10, 1881.	dis 20@ 25c
Copper Rivets and Burns.	dis 20@ 25c
# B. 40¢ per lb. 5¢ per doz. 6¢ per 100 7¢ per 1000 8¢ per 1000	dis 20@ 25c
Rivet Sets.	dis 20@ 25c
Rods.	dis 20@ 25c
Star, Brass.	dis 20@ 25c
Star, Black Walnut.	dis 20@ 25c
Star, American Patent.	dis 20@ 25c
Rollers.	dis 20@ 25c
Barn Door, Sargent's list.	dis 20@ 25c
Anti-Friction.	dis 20@ 25c
Hope.	dis 20@ 25c
Mnts' Lit. t. June 5, 1882.	dis 20@ 25c
Manilla.	1/4 inch and larger dis 10@ 15c
Manilla.	1/4 and 1/2 inch dis 10@ 15c
Manilla, Tard' Rope.	1/4 and 1/2 inch dis 10@ 15c
Manilla, Tard' Lath Yarn.	1/4 and 1/2 inch dis 10@ 15c
Manilla, Hay Rope.	1/4 and 1/2 inch dis 10@ 15c
Sisal.	1/4 inch and larger dis 10@ 15c
Sisal.	1/4 and 1/2 inch dis 10@ 15c
Sisal, Hay Rope.	1/4 and 1/2 inch dis 10@ 15c
Rules.	Boxwood, Ivory.
Chapin's.	dis 60@ 10c
Stephens.	dis 60@ 10c
Comb'd Irons.	From 4 to 10 lb.
Self Heating.	1/2 lb. 3¢ net
Self Heating, Tailors.	1/2 lb. 3¢ net
Gleason's Shield and Toilet.	dis 25c
Mrs. Pott's Irons, Doubled Pointed.	dis 25c
Mrs. Pott's Irons, Square Back.	dis 25c
Emerson's Irons.	dis 25c
Combined Fluted and Sad Irons.	1/2 lb. 3¢ net
Sand Paper.	Baeder & Adamson's Flint, co to 1/4. \$4.75 per ream
Baeder & Adamson's Flint.	2 1/2 & 3. 5¢ per ream
Baeder & Adamson's Flint, Assorted.	4.75 per ream
Baeder & Adamson's Flint.	\$4.75 per ream
Bartles Flint.	\$4.75 & \$5.50 per ream dis 35c
Bartles Harrison, \$1.75 per ream.	dis 35c
McGraw's.	McGraw's, same list as B. & A. Flint.
Sash Cord.	Sand Paper.
Common.	Baeder & Adamson's Flint, co to 1/4. \$4.75 per ream
Patent.	2 1/2 & 3. 5¢ per ream
Silver Lake, Hemp.	dis 20@ 10c
Silver Lake, Drab Cotton.	dis 20@ 10c
Raw Hide.	dis 20@ 10c
Sash Weights.	dis 10@ 15c net
Sausage Stuffers or Fillers.	dis 20@ 10c
Pipes.	dis 20@ 10c
Straw Cut No. 4.	each \$20.00, dis 25c
Enterprise Mfg. Co.	dis 25c
Silver's.	dis 25c
Saws.	Douston Circular.
Douston's Mill.	dis 40@ 10c
Douston's Cross Cut.	dis 40@ 10c
Douston's Hand Plane, Rip, &c.	dis 20@ 10c
Boynton's Lighting Circular.	dis 20@ 10c
Boynton's Circular, all lengths, new list.	dis 20@ 10c
Boynton's Biller Webs, 30 inch, new list.	dis 20@ 10c
Boynton's Lighting Buck Saws X Bar.	dis 20@ 10c
Boynton's Lighting Hand Planer Rip.	dis 20@ 10c
W. M. & C. Mfg. Co. Cross Cuts.	dis 20@ 10c
The Perfect, Clark & Smith, Por. K' b Jap.	dis 20@ 10c
The Perfect, Clark & Smith, N-Plated.	dis 20@ 10c
"Universal".	dis 20@ 10c
Saw Frames.	Clark's, No. 1, \$10.00; No. 2, \$20.00 per gross.
White, Vermont.	dis 20@ 10c
Red, Polished and Varnished.	dis 20@ 10c
Saw Rods.	dis 20@ 10c
Saw Sets.	Boynton's Patent X Cut, per doz. \$12.00; Hand Saw
Stillman's Genuine.	dis 20@ 10c and \$10.00 to 10c
Stillman's Imitation.	dis 20@ 10c and \$10.00 to 10c
Common Lever.	dis 20@ 10c and \$10.00 to 10c
No. 1, \$10.00; No. 2, \$20.00.	dis 20@ 10c and \$10.00 to 10c
Nash's.	dis 20@ 10c
Hammer, Hotchkiss.	dis 20@ 10c
Bammer, Benja & Call Co.'s new Patent.	dis 20@ 10c
Bammer & Call Co.'s Spring Hammer.	dis 20@ 10c
Bammer & Call Co.'s Plate.	dis 20@ 10c
Bammer & Call Co.'s Cross Cut.	dis 20@ 10c
Aiken's Genuine.	dis 20@ 10c
Aiken's Imitation.	dis 20@ 10c
Hart's Circular Lever.	dis 20@ 10c
Douston's.	dis 20@ 10c
Morrill's.	NO. 1, \$15; NO. 2, \$25. dis 20@ 10c
Scales.	Hatch, Counter, No. 171. dis 20@ 10c
Hatch, No. 100.	dis 20@ 10c
Union Platform Scale.	dis 20@ 10c
Buffhanks'.	dis 20@ 10c
Forgthy Scale Co.	dis 20@ 10c
Buffalo Scale Co.	dis 20@ 10c
Trucks (Warehouse, &c.).	dis 20@ 10c
Penfield Block Co., Reduced list March 4, 1882.	dis 20@ 10c
Vises.	Travels.
Solid Box.	Lothrop's Brick and Plastering.
Solid Box.	Reed's Brick and Plastering.
Parallel, Wilkins'.	Douston's Brick and Plastering.
Parallel, Wilson's.	Reed's Brick and Plastering.
Parallel, Howard's.	Clement & Hayward's.
Parallel, Sargent's.	Rose's Brick.
Parallel, Sargent's and Union.	Braes' Brick.
Parallel, Oval Slide.	Worrell's Brick and Plastering.
Parallel, Double Screw Leg.	Garden.
Parallel, Frentiss.	Tricks and Cheese.
Parallel, Fret.	Tricks and Cheese.
Parallel, Adjustable.	Tricks and Cheese.
Family, List.	Tricks and Cheese.
Saw Flies, Bonney's.	Reed's Brick and Plastering.
Saw Flies, Stearn's.	Douston's Brick and Plastering.
Saw Flies, Hopkins'.	Reed's Brick and Plastering.
Reading.	Reed's Brick and Plastering.
Cowell Hand Vises.	Reed's Brick and Plastering.
Richardson's Vise and Anvil.	Reed's Brick and Plastering.
Washer Cutters.	Brace and Copper, list of June 10, 1880.
Smith's Patent.	Bright and Annealed.
Johnson's.	No. 0 @ 10c, dis 20@ 10c
Douston's.	Bright and Annealed.
Douston's Patent Excelsior.	No. 10 @ 20c, dis 20@ 10c
Buck Bros.	Bright and Annealed.
Stanley Rule & Level Co., Standard Hdw.	No. 20 @ 25c, dis 20@ 10c
Stanley Rule & Level Co., Black Handles.	No. 20 @ 25c, dis 20@ 10c
Sargent & Co.'s.	No. 20 @ 25c, dis 20@ 10c
Gay's Double Action Ratches.	No. 20 @ 25c, dis 20@ 10c
W. & C. Co.'s Double Action Clutch.	No. 20 @ 25c, dis 20@ 10c
# doz. 4 in., \$2.00; 5 in., \$2.00; 6 in., \$2.00—dis 35c	No. 20 @ 25c, dis 20@ 10c
Champion.	dis 20@ 10c
Cowles Hdw. Co., No. Extra.	dis 20@ 10c
Cowles Hdw. Co., No. 1.	dis 20@ 10c
Cowles Hdw. Co., Nos. 4 and 6.	dis 20@ 10c
Clark's Patent.	dis 20@ 10c
Screws.	Flat H'd Iron.
New list April 27, 1881.	dis 20@ 10c
Round H'd Iron.	dis 20@ 10c
Flat Head Brass.	dis 20@ 10c
Brass and Silver Capped.	dis 20@ 10c
Japanned, Intaglio, Gilt Point.	dis 20@ 10c
Coach, Common or Lag.	dis 20@ 10c
Bed.	dis 20@ 10c
Machine, Flat Head, Iron.	dis 20@ 10c
Machine, Round Head, Iron.	dis 20@ 10c
Banah, Iron.	dis 20@ 10c
Banch, Wood, Beech.	dis 20@ 10c
Banch, Wood, Hickory.	dis 20@ 10c
Hand Rail, Sargent's.	dis 20@ 10c
Hand Rail, Humason, Beckley & Co.'s.	dis 20@ 10c
Hand Rail, Am. Screw Co., list of Jan. 1, '81.	dis 20@ 10c
Jack (Wilson's).	dis 20@ 10c
Screen Windov Balances.	Brace and Copper, list of June 10, 1880.
R. D. Hugunin's, (4 to a set) # doz sets, \$15.00.	Bright and Annealed.
Listed # doz sets.	No. 0 @ 10c, dis 20@ 10c
Rogers, \$5.00.	Bright and Annealed.
Shears and Scissors.	Brass and Copper, list of June 10, 1880.
American (Cast) Iron.	Bright and Annealed.
Pruning.	see Pruning Hooks and Shears.
Barnard's Lamp Trimmers.	dis 20@ 10c
Firebox.	dis 20@ 10c
Seymour's, List, Dec. 1881.	dis 20@ 10c
Heinch's, List, Dec. 1881.	dis 20@ 10c
Heinch's Tailor's Shears.	dis 20@ 10c
Mass. Cutlery Co. Sc. Trimmers.	dis 20@ 10c
Sheaves.	Sliding Shutter, M. W. & Co. list.
dis 40@ 10c	Sliding Shutter, R. & E. list.
Sliding Door, R. & E. list.	dis 20@ 10c
Sliding Door, Patent Roller.	dis 20@ 10c
Sliding Door, Patent Roller, Hattfield's.	dis 20@ 10c
Sliding Door, Russell's Anti-Friction.	dis 20@ 10c
Sliding Shutter, Sargent's list.	dis 20@ 10c
Sliding Shutter, Sargent's list.	dis 20@ 10c
Sliding Shutter, Reading list.	dis 20@ 10c
Sliding Shutter, Anti-Friction (Hanging).	dis 20@ 10c
Shovels and Spades.	Griffiths, New list, July 1, 1881.
dis 10@ 15c	Old Colony.
dis 10@ 15c	Payne Petetbon & Son, new list.
dis 10@ 15c	Payne Petetbon & Son, R. R. Shovels.
dis 10@ 15c	Edington & Lowman's Patent.
dis 10@ 15c	Bowland's.

## WINCHESTER'S REPEATING RIFLES

ASK FOR PRICES.  
ALFORD, WARD, DAYENPORT & C.  
77 CHAMBERS STR., N.Y.

## The Iron-Masters' LABORATORY.

Exclusively for the  
Analysis of Ores of Iron, Pig and Manufactured Iron, Steels, Limestone, Clays, Slags and Coal for Practical Metallurgical Purposes.

No. 339 Walnut St., Philadelphia,  
With Branch at Warrenton, Virginia,

J. BLODGET BRITTON.

This laboratory was established in 1866, at the instance of a number of practical Iron Masters, expressly to afford prompt and reliable information upon the chemical composition of the substances above mentioned, for smelting and refining purposes. The object being to make it at once a convenient, practically useful, and comparatively inexpensive adjunct to the Furnace, Forge and Rolling Mill.

CHARGES TO IRON WORKS.  
For determining the per cent of Pure Iron in any Estimated Ore. \$4.00  
For the per cent of Pure Iron, Sulphur and Phosphorus in do. 1.50  
For each additional constituent of one cent  
For those of unusual occurrence or difficult to determine, the charge must necessarily depend upon circumstances.

For determining the per cent of Sulphur or Phosphorus in Iron or Steel. 7.00

For each additional constituent of usual occurrence. 6.00

For the per cent of Carbon, Lime, and insoluble Siliceous Matter in a Limestone. 10.00

For each additional constituent. 3.00

For the per cent of Water, Volatile Combustible Matter, fixed Carbon, and Ash in Coal. 12.50

For determining the constituents of a Clay, Slag, Coke, or of an Ash in Coal the charges will correspond with those for the constituents of an ore.

For a written opinion or letter of instruction the charge must necessarily depend upon circumstances.

Printed instructions for obtaining proper average samples for analysis furnished upon application

S. H. & E. Y. MOORE,  
163 & 165 LAKE ST., CHICAGO,  
AGENTS FOR

PROVIDENCE TOOL CO.,

W.H. Haskell & Co., Reading Bolt and Nut Works, Syracuse Bolt Co.

Hotchkiss & Upson Co., Black Diamond File Works, Saranac Horse Nail Company.

MANUFACTURERS OF

## Bolts, Nuts, Washers, Gimlet Point Coach Screws, Threshing Machine Teeth, Wood Screws, Files, Horse Nails, Rope and Iron Strapped Blocks, Iron Take Blocks, Turn Buckles, Ship Chandlery Hardware, &c.

ALSO MANUFACTURERS OF  
Climax Barn Door Hangers, Baggage Car Door Hangers, Sliding Door Sheaves, Freight Car Door Rollers and Hangers.

MOORE'S DIFFERENTIAL PULLEY BLOCKS, MOORE'S HAND HOISTS, &c.



FOR IRON TRACK.

The sales of Iron Track "Climax" were greater in 1881 than in any previous year. We solicit from them a continuance of the patronage of the trade. We call especial attention to our new Wood Track "Climax," and confidently assert its superiority to any Wood Track Hanger ever offered to the trade. Send for Illustrated Price List.

S. H. &amp

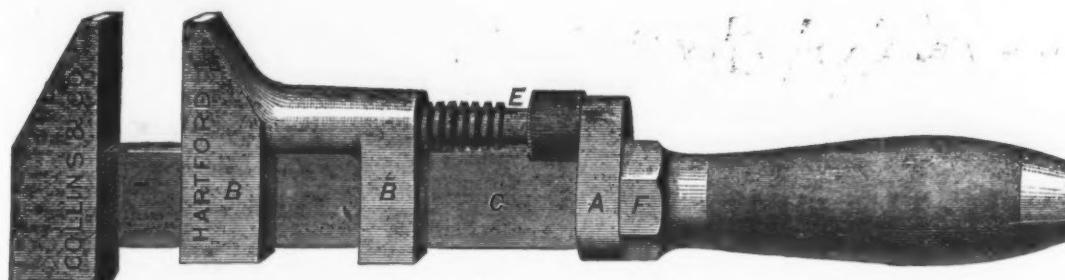


# IMPORTANT DECISION

BY JUDGE LOWELL OF THE UNITED STATES CIRCUIT COURT.

# THE COLLINS COMPANY VS. L. COES ET AL.

COLLINS & CO.'S WRENCHES, THE JORDAN & SMITH PATENT.



This suit was brought for an infringement of the above patent, which covers the principle of a large nut upon the bar forward of the handle, to relieve it from the back thrust of the movable jaw, which back thrust had prior to this improvement been transmitted through the handle to the small and weak tip or nut at the end of the handle. The infringement was persistently continued for years, until the decision of the Court compelled the infringers to abandon the use of a supporting nut, which is the valuable feature of all Collins Wrenches.

The Collins Wrench (the J. & S. patent), as illustrated above, has a step-plate A, (furnishing a support for the screw E and its jaw B,) so slotted as to permit the Wrench bar to pass through it without reduction in the size of the bar.

The large nut F is threaded on its interior, and engages in a thread on the bar C, and is screwed up firmly against the step A.

The infringement of Coes consisted of also putting a nut upon the bar, which was concealed within a hollow ferrule forward of the handle.

The case was decided in favor of the Collins Co., who hereby warn all persons against making or selling Screw Wrenches embodying the features of their supported Screw Wrench. The Collins Wrenches are made with wide bars of uniform size. They are stronger at the point where all other Wrenches are the weakest, viz., that part of the bar immediately forward of the handle. So-called reinforced bars and ribbed jaws, &c., are devices which add nothing to the real strength of the Wrench.

#### PRICE LIST OF COLLINS WRENCHES.

	Bright.	Black.		Bright.	Black.
6 inch	\$10.00	\$9.00	15 inch	-	-
8 inch	11.00	10.00	18 inch	-	-
10 inch	14.00	12.00	21 inch	-	-
12 inch	16.00	14.00			

Western Depot for Collins Wrenches, **E. H. LINLEY**, St. Louis, Mo.

For discounts, &c., apply to

**COLLINS & CO., 212 Water Street, New York.**

LAMBETH'S  
PATENT IMPROVED  
**FLY FAN.**  
OVER 100,000 NOW IN USE.

FOWLER PAT. FLY FAN.  
OVER 50,000 NOW IN USE.

Among the best and fastest selling articles ever introduced.  
Sold by dealers in Housefurnishing Goods, Hardware, Crockery  
&c.

The luxury of the age.  
No home complete without one.  
Equally a blessing in Dining Room and Chamber.  
It drives all flies away by the shadow and movement of the wings while revolving, and is indispensable for the enjoyment of a good meal or nap.

The machine is self-acting. Keeps flies off the table, winds up like a clock, and runs about one hour and a half at each winding.

For convenience, a key is attached to the case, so that it can be rewound at any time, and run as long as desired.

It is light and portable, a perfect substitute for the old fly brush in the hands of a servant, and occupies less space on the table than a caster.

It fills a long-endured want in the household, and is so simple that a child can operate it.

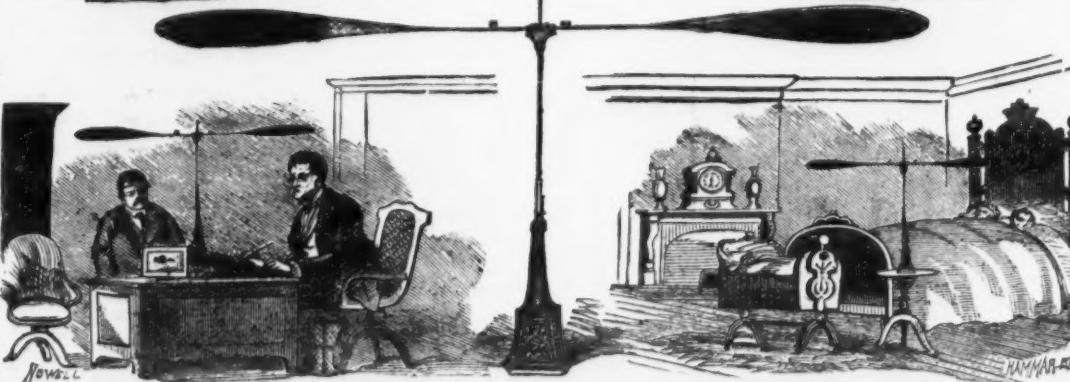
The first cost is a permanent investment, as it will last many years.

It has been adopted in a large number of the first hotels and private families, and wherever introduced has given entire satisfaction.

It is easily set on a bed or chair to keep flies off children or the sick.

To the invalid, in summer, it will be a most welcome companion.

Send for Illustrated Circular containing testimonial letters and fuller description.



Patented Dec. 1, 1863; May 12, 1864; Jan. 16, 1867; April 17, 1867; March 9, 1868; June 8, 1868; June 29, 1868; Nov. 23, 1868.

PHILADELPHIA, June 8th, 1882.

To the TRADE: Dear Sirs.—Having obtained sole control of the Fowler Fly Fan, heretofore manufactured and sold by Mr. W. R. Lafourcade, and recently advertised by him as the "Fowler Fly Fan," we will sell all its improvements, which we have of them in stock to the trade at the prices I have hitherto quoted for the same this season. When this supply is exhausted, however, there will be no more of this style manufactured, as I shall hereafter make only my improved Fans, known as the "Lambeth Patent Improved Fly Fans," which are much superior in durability, efficiency and beauty, as shown by testimonial letters.

As I am now the sole proprietor and manufacturer of the only Fly Fans that are made, uniform prices at the rates established by me this season will be strictly observed, viz.:

RETAIL PRICE.

Lambeth's Pat. Imp'd Fly Fan, No. 1, each, \$4.00  
Fowler Fly Fan, each, 3.00

TRADE PRICE.

Lambeth's Pat. Imp'd Fly Fan, No. 1, by single doz., \$35.00  
Fowler Fly Fan, by single doz., 27.00  
Hoping you will favor me with your orders for this indispensable household comfort,

I am very truly yours,

**S. W. LAMBETH,**

SOLE PROPRIETOR AND MANUFACTURER OF

Lambeth's Pat. Imp'd and Fowler Fly Fans,  
No. 42 South 3d St., Philadelphia, Pa.

N. B.—Mr. W. R. Lafourcade has sent the following letter to the parties from whom he has solicited orders for the Fowler Fly Fan:

PHILADELPHIA, June 8th, 1882.

Sir.—Mr. S. W. Lambeth having obtained sole control of the Fowler Fly Fan with all its improvements, I will be unable to fill your orders as I undertook.

Yours truly,  
W. R. LAFOURCADE.

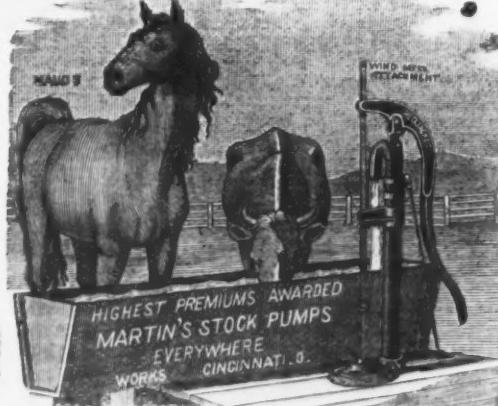


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See Page 3.

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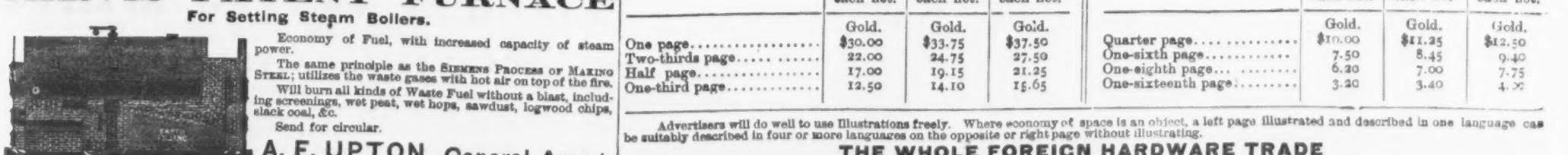
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**SUBSCRIPTIONS**

to the *Ironmonger and Metal Trades' Advertiser*, with which is sent every fourth week the Foreign Supplement (see below), may commence from any date, but are not received for less than a year complete. The rate is \$5 per annum, inclusive of postage to any part of the world outside Great Britain. To every subscriber is presented, free, in the course of his year, a handsome and useful *Ironmongers' Diary and Text Book*, a work sold to non-subscribers at 75 cents.

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**THE FOREIGN SUPPLEMENT,**With which is incorporated *The Universal Engineer*,Is published every fourth week in connection with the extensive and world-wide circulation of the *Ironmonger* itself. The dates of its publication for the next twelve months will be as follows:

JUNE 17, JULY 8, AUGUST 5, SEPTEMBER 5 and 30, OCTOBER 28, NOVEMBER 25, DECEMBER 23, 1882, JANUARY 20, FEBRUARY 17, MARCH 10, APRIL 7, MAY 5, JUNE 2, 1883.

This Supplement is published in

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so far as our experience of twenty years is concerned, will be covered by *The Foreign Supplement* at least twice a year. Thus a Price List or Advertisement inserted in the *Ironmonger* and *Foreign Supplement* is a strikingly powerful and most efficient way of publicity not to be compared with any of the other ordinary channels of communication.

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This tool has been thoroughly tested, and has given the greatest satisfaction to all who have tried it. The principle on which it works makes it self-cleaning and prevents adhesion in sticky soil; therefore it always works free and easy. It is far superior to all ploughs, augers and boring machines, as it works well in stony, sandy, or clay soils; quicksand under water is as easily removed as though no water existed.

### DIRECTIONS.

Plunge the Digger into the ground, as shown in cut, Fig. 1, and when the soil is loosened pull out the lever with one hand, as shown in cut, Fig. 2, which will press the dirt between the blades; then draw the Digger from the hole, keeping hold of the lever with one hand and the handle with the other. When the Digger is clear of the hole, you can deposit the load anywhere within reach by simply pressing down the lever, which will open the blades and the dirt will fall from between them. The Digger is then ready for another plunge. The steel blades are nine inches long, and the whole tool five feet long. For sale at Hardware and Agricultural Stores.

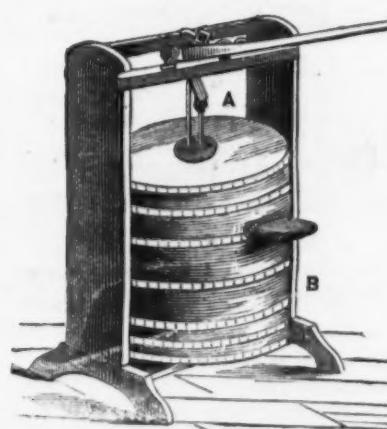
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**BAYLISS' HURRICANE BELLOWS,**  
Portable Forges and Hot Blast  
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SUPERIOR TO ANY. Send for Circulars.



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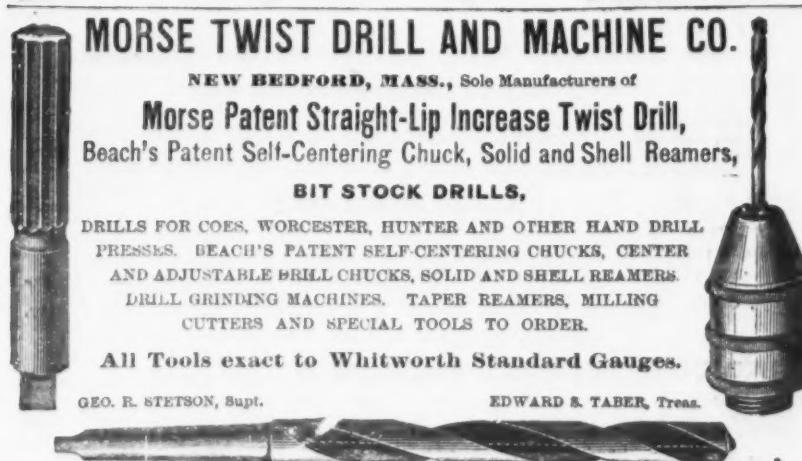
### BIT STOCK DRILLS,

DRILLS FOR COES, WORCESTER, HUNTER AND OTHER HAND DRILL PRESSES. BEACH'S PATENT SELF-CENTERING CHUCKS, CENTER AND ADJUSTABLE DRILL CHUCKS, SOLID AND SHELL REAMERS. DRILL GRINDING MACHINES. TAPER REAMERS, MILLING CUTTERS AND SPECIAL TOOLS TO ORDER.

All Tools exact to Whitworth Standard Gauges.

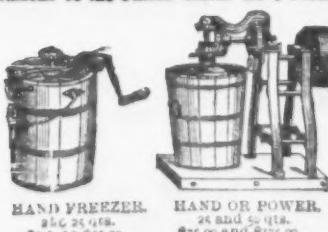
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### SANDS' TRIPLE MOTION WHITE MOUNTAIN ICE CREAM FREEZERS.

THE WHITE MOUNTAIN FREEZER COMPANY are headquarters for Ice Cream Freezers and Ice Crushers, being the only firm in the United States who manufacture all parts of the raw material. The examining Committee, consisting of 50,000 citizens of the United States have recom-



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ICE CRUSHER.  
\$75.00 and \$100.00  
\$65.00 to \$95.00.

HAND OR POWER  
ICE CRUSHER.  
\$75.00 and \$100.00  
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White Mountain Freezer Co.,  
Nashua, N. H., U. S. A.

SPECIAL ATTENTION GIVEN TO EXPORT ORDERS.

### The Most Durable and Best Selling Bucket for Chain Pumps.

It has no valves to become obstructed and no screw joints to become unmovable by rust.

Advantages of the Crosby Bucket over all others.—1. It has an air chamber on top, which conducts the air to the bottom of the bucket. 2. It is inexpensive, the bucket being 1/8 of an inch larger in diameter than the bore in the tubes, which allows it to expand, and the groove in the side to catch the water. 3. The wear comes on the whole side, and not on the extreme edge like other buckets.

4. It contains more solid rubber than three of any other manufacturer.

This bucket—1/4 inch for deep wells, 1/2 inch for 40 feet or less, a inch for stock pumps.

No charge for Territorial Rights.

NONE GENUINE unless A. D. Crosby appears in raised letters on base of each Bucket.

Send for Price List. Agents wanted in every city, D. Crosby, Patentee and General Agent, Cull, Allegany county, N. Y. For Sale by W. & R. Douglass, 25 and 47 John St., N. Y., and all General Hardware and Pump Dealers.

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Jack  
**CREWS.**

Cast with perfect seamless thread by new patent process.

Much cheaper than wrought iron and warranted to stand more pressure.

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### Prouty's Patent PEERLESS FORCE PUMP.

Has Self-Adjustable Foot Rest.

NEW AUTOMATIC COMPENSATING  
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It will throw a continuous jet from  
FORTY TO SIXTY FEET. A new pattern  
jet and spray nozzle is sent with  
each pump.

Especial attention is called to the  
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**GENUINE BABBITT,** Guaranteed at a speed of 10,000 a minute, and at any pressure for 12 years.

PHILADELPHIA SMELTING COMPANY.—GENTLEMEN: We have been running your "Genuine Babbitt" on our wood drilling machine for the last eight years at a speed of 1000 revolutions per minute, without renewal. We have found it to be the best metal we ever used.

Yours truly,  
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Superior to Phosphor Bronze or any other alloy of Copper and Tin for Machinery Journals.

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PHILADELPHIA SMELTING COMPANY, City.—GENTLEMEN: After a trial of eighteen months of your "Deoxidized Bronze" as our rolling mill, where great pressure is required, we take pleasure in recommending it as being superior to any we have heretofore used.

Very truly,  
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Skelp Iron, Splice Bars, Railway Track Bolts, Car, Bridge,  
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We invite the attention of RAILROAD MEN especially to our make of SPLICE BARS and Track Bolts. Using the best brands of REFINED IRON, and paying close attention to the finish of our manufacture, we are enabled to offer our patrons BOLTS, NUTS, SPLICE BARS, &c., of excellent quality. Our works have been enlarged within a few years; all orders are now executed with promptness; all our work guaranteed.

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PECK'S DROP LIFTER is the only one which has its parts cushioned. Being thus cushioned they are the most durable lifter in the market.

Can be attached to any drop now in use.

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EXCISION POLISH, METAL QUARTZ, PUMICE, ROTTEN STONE, CROCUS, ROUGE, GLUE SAND PAPER, EMERY PAPER, AND CLOTH, & C. WALPOLE EMERY MILLS.

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Steel Toe Calk.

FINISHED READY FOR NAILING ON.

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The Best and Cheapest Shoe Made.

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Manufacturers of

FINE GRAY IRON CASTINGS OF EVERY DESCRIPTION.

Buckles and Pickets for Wire Workers, Castings for Furniture and Piano Manufacturers. Iron and Metal Patterns of all kinds a Specialty.

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Terms, 30 days. For 60 or 90 days, interest added at 10% per cent. per annum.

Anvils.	
Peter Wright's, 3' 3"	100 <i>per</i> <sup>2</sup>
Over 200 lbs.	11 <i>per</i> <sup>2</sup>
Trenton	10 <i>per</i> <sup>2</sup>
Apple Pears.	
Globe Apple Pears.	5 <i>per</i> <sup>2</sup>
Penn Apple Pears	5 <i>per</i> <sup>2</sup>
Lots of 10 to 24 dozen special prices.	
Bay State Peach Pears	5 <i>per</i> <sup>2</sup>
Axes.	
Hart's Kentucky and Yankee, per doz.	10 <i>per</i> <sup>2</sup>
Robert Mann.	8 <i>per</i> <sup>2</sup>
Richland Chief.	8 <i>per</i> <sup>2</sup>
Bevelled Axes.	adu sec.
"	net
Doublé Axes.	1 <i>per</i> <sup>2</sup>
Augers and Auger Bits.—New List Jan. 1, 1882.	
Cook's Augers.	4 <i>per</i> <sup>2</sup>
Watrous' Ship Augers.	1 <i>per</i> <sup>2</sup>
Benjamin Pierce Auger Bits.	4 <i>per</i> <sup>2</sup>
Ortiz's Auger Bits.	4 <i>per</i> <sup>2</sup>
Cook's Auger Bits.	4 <i>per</i> <sup>2</sup>
Jennings'	1 <i>per</i> <sup>2</sup>
"	net
Bonney's Pat. Hol. Augers, list \$8 <i>per</i> doz.	8 <i>per</i> <sup>2</sup>
Stearns' Pat. Hol. Augers, list \$4 <i>per</i> doz.	5 <i>per</i> <sup>2</sup>
Bells.	
Bavin Bros. Mfrs. Co. Light Hand Bells.	6 <i>per</i> <sup>2</sup>
Swiss Pattern Hand Bells.	low list 6 <i>per</i> <sup>2</sup>
Connell's Door Bells.	10 <i>per</i> <sup>2</sup>
G. Western & Kentucky Cow, new list.	5 <i>per</i> <sup>2</sup>
Fine Machines.	
W. C. Smith, 1 <i>per</i> user.	List 5 <i>per</i> <sup>2</sup>
Angular, without Augers.	6 <i>per</i> <sup>2</sup>
Boats—Eastern Carriage Boats.	doz 8 <i>per</i> <sup>2</sup>
Philadelphia.	new list 7 <i>per</i> <sup>2</sup>
Stanley, Wrought Shutter.	doz 10 <i>per</i> <sup>2</sup>
Braces—Barber?	doz 4 <i>per</i> <sup>2</sup>
Backups.	doz 4 <i>per</i> <sup>2</sup>
Spoon.	doz 4 <i>per</i> <sup>2</sup>
American Ball.	doz 4 <i>per</i> <sup>2</sup>
Butts.—Cast Fast Joint, Narrow.	doz 4 <i>per</i> <sup>2</sup>
" " Broad.	doz 4 <i>per</i> <sup>2</sup>
Cast Loose Joint, Narrow.	doz 4 <i>per</i> <sup>2</sup>
" " Broad.	doz 4 <i>per</i> <sup>2</sup>
Acorn, Loose, Pin.	doz 4 <i>per</i> <sup>2</sup>
" Jap'd.	doz 4 <i>per</i> <sup>2</sup>
Mayer's Loose Joint.	doz 4 <i>per</i> <sup>2</sup>
Wrought Loose Pin.	doz 4 <i>per</i> <sup>2</sup>
" Narrow, Fast.	doz 4 <i>per</i> <sup>2</sup>
" Loose Joint.	doz 4 <i>per</i> <sup>2</sup>
Blind Butts.	
Parker.	doz 7 <i>per</i> <sup>2</sup>
Clark.	doz 7 <i>per</i> <sup>2</sup>
Eaton.	doz 7 <i>per</i> <sup>2</sup>
Linn & Porter.	doz 5 <i>per</i> <sup>2</sup>
Buffet's.	doz 4 <i>per</i> <sup>2</sup>
Chafers—German Halter and Coll. list December 31, 1881.	
Galvanized Pump.	doz 5 <i>per</i> <sup>2</sup>
Best Proof Coil Chain—English.	doz 9 <i>per</i> <sup>2</sup>
5 <i>per</i> <sup>2</sup>	1 <i>per</i> <sup>2</sup>
+15 4 <i>per</i> <sup>2</sup>	1 <i>per</i> <sup>2</sup>
Chips—Socket Framing.	doz 6 <i>per</i> <sup>2</sup>
Socket Firmer.	doz 6 <i>per</i> <sup>2</sup>
Butcher's.	doz 6 <i>per</i> <sup>2</sup>
Casters.—Bed (new list July 1, 1880).	doz 5 <i>per</i> <sup>2</sup>
Plate.	doz 5 <i>per</i> <sup>2</sup>
Coffee Mills.—Box and Side, new list Jan. 1, 1880.	doz 4 <i>per</i> <sup>2</sup>
Enterprise.	doz 4 <i>per</i> <sup>2</sup>
Cutlery—Golden Pocket.	new list net
Pemb. Knifef. & Clark, J. H. Howell & Co., Lamson & Goodnow Mfg. Co. and Meriden Cutlery Co., Manufacturers' prices net.	new list net
Drawing Knives.	doz 6 <i>per</i> <sup>2</sup>
Hart Mfg. Co. 9 <i>per</i> <sup>2</sup>	doz 5 <i>per</i> <sup>2</sup>
Fry Pans.	
Timber.	doz 4 <i>per</i> <sup>2</sup>
\$10 <i>per</i> <sup>2</sup>	4 <i>per</i> <sup>2</sup>
No. 0 1 2 3 4 5	5 <i>per</i> <sup>2</sup>
Burnished.	doz 6 <i>per</i> <sup>2</sup>
doz 3 <i>per</i> <sup>2</sup>	3 <i>per</i> <sup>2</sup>
doz 3 <i>per</i> <sup>2</sup>	3 <i>per</i> <sup>2</sup>
Geneva Fluter.	doz 2 <i>per</i> <sup>2</sup>
Favorite com. Fluter & Sad Iron.	doz 2 <i>per</i> <sup>2</sup>
Hammers.	
Yerkes & Plumb's new list.	doz 3 <i>per</i> <sup>2</sup>
May & Hammers.	doz 5 <i>per</i> <sup>2</sup>
Howell A. E. Nail Hammers.	per doz. net \$1.75
Handles.	
Diston Loop Handles Crosscut.	doz 1 <i>per</i> net
Boynton Loop Handles Crosscut.	doz 1 <i>per</i> net
Hatchets.	
Verm. & Plumb, new list.	doz 3 <i>per</i> <sup>2</sup>
Hinges.	
Strap and T.	doz 4 <i>per</i> <sup>2</sup>
Horse Nails.	Nos. 5 6 7 8 9 10
Audited.	doz 4 <i>per</i> <sup>2</sup>
" Pol'd & P'td and Blued and Pointed.	doz 2 <i>per</i> <sup>2</sup>
Globe.	New list. doz 2 <i>per</i> <sup>2</sup>
" Pol'sh'd & Pointed.	doz 2 <i>per</i> <sup>2</sup>
Blacksmith Favorite, all sizes.	120 lb.
Discount on Ausable, 2 <i>per</i> <sup>2</sup> ; Clinton, 2 <i>per</i> <sup>2</sup>	
Gloves.	
Hats and Straw Knives.	
Lightning.	per doz, net \$18 <i>per</i> <sup>2</sup>
Electric.	1 <i>per</i> <sup>2</sup>
Wad-worth.	1 <i>per</i> <sup>2</sup>
Wool Stock Knives.	1 <i>per</i> <sup>2</sup>
Locks and Knobs.	
Branford.	new list doz 4 <i>per</i> <sup>2</sup>
Gaylor Cabinet.	doz 3 <i>per</i> <sup>2</sup>
American.	doz 3 <i>per</i> <sup>2</sup>
Scandinavian Padlocks.	doz 4 <i>per</i> <sup>2</sup>
doz 8 <i>per</i> <sup>2</sup>	5 <i>per</i> <sup>2</sup>
No. 57 58 59 60 61 62	5 <i>per</i> <sup>2</sup>
No. 60.	8 <i>per</i> <sup>2</sup>
doz 8 <i>per</i> <sup>2</sup>	5 <i>per</i> <sup>2</sup>
Lanterns.	Larze list net; small list net
Tutular.	No. 5 6 <i>per</i> <sup>2</sup>
Globe.	No. 5 6 <i>per</i> <sup>2</sup>
Long & Short Cutter.	new list.
Pennsylvania Pattern.	doz 3 <i>per</i> <sup>2</sup>
Measuring Tools.	
Empire Mix Co.'s Measuring Faucets.	doz 2 <i>per</i> <sup>2</sup>
Steibling's Gates.	doz 2 <i>per</i> <sup>2</sup>
Lincoln's.	doz 2 <i>per</i> <sup>2</sup>
Landers, Frary & Clark's Petroleum.	doz 2 <i>per</i> <sup>2</sup>
Brown Liquor Cocks, new list Jan. 1, 1880.	doz 2 <i>per</i> <sup>2</sup>
Cork Lined.	doz 2 <i>per</i> <sup>2</sup>
Meat Cutters.	
Dixon.	doz 2 <i>per</i> <sup>2</sup>
Woodruff.	doz 2 <i>per</i> <sup>2</sup>
Stone.	doz 2 <i>per</i> <sup>2</sup>
Hale's.	new list, doz 1 <i>per</i> <sup>2</sup>
American.	doz 2 <i>per</i> <sup>2</sup>
Stainless.	doz 2 <i>per</i> <sup>2</sup>
Measuring Stufers.	
Planes—Sandusky Tool Co.	doz 2 <i>per</i> <sup>2</sup>
Orgons.	doz 2 <i>per</i> <sup>2</sup>
Ohio & Auburn.	doz 2 <i>per</i> <sup>2</sup>
Boile & L. Co.	doz 2 <i>per</i> <sup>2</sup>
Plane Irons—Ohio Tool Co.	doz 2 <i>per</i> <sup>2</sup>
Butchers.	
Plumbs and Levels.	
Stanley's Adjustable.	doz 2 <i>per</i> <sup>2</sup>
Picks—New list.	doz 3 <i>per</i> <sup>2</sup>
Razor Straps.	
Lamont Combination.	per doz. \$4 <i>per</i> <sup>2</sup>
Imitation Emerson.	1 <i>gross</i> 10 <i>per</i> <sup>2</sup>
Harris—Stanley Boxwood.	per doz. 2 <i>per</i> <sup>2</sup>
Stanley Ivory.	doz 5 <i>per</i> <sup>2</sup>
Steelyards—Hart's Pattern.	doz 10 <i>per</i> <sup>2</sup>
doz 14 <i>per</i> <sup>2</sup>	12 <i>per</i> <sup>2</sup>
17 <i>per</i> <sup>2</sup>	13 <i>per</i> <sup>2</sup>
18 <i>per</i> <sup>2</sup>	14 <i>per</i> <sup>2</sup>
American Pattern.	doz 10 <i>per</i> <sup>2</sup>
doz 12 <i>per</i> <sup>2</sup>	10 <i>per</i> <sup>2</sup>
doz 14 <i>per</i> <sup>2</sup>	12 <i>per</i> <sup>2</sup>
doz 16 <i>per</i> <sup>2</sup>	14 <i>per</i> <sup>2</sup>
doz 18 <i>per</i> <sup>2</sup>	16 <i>per</i> <sup>2</sup>
doz 20 <i>per</i> <sup>2</sup>	18 <i>per</i> <sup>2</sup>
doz 22 <i>per</i> <sup>2</sup>	20 <i>per</i> <sup>2</sup>
doz 24 <i>per</i> <sup>2</sup>	22 <i>per</i> <sup>2</sup>
doz 26 <i>per</i> <sup>2</sup>	24 <i>per</i> <sup>2</sup>
doz 28 <i>per</i> <sup>2</sup>	26 <i>per</i> <sup>2</sup>
doz 30 <i>per</i> <sup>2</sup>	28 <i>per</i> <sup>2</sup>
doz 32 <i>per</i> <sup>2</sup>	30 <i>per</i> <sup>2</sup>
doz 34 <i>per</i> <sup>2</sup>	32 <i>per</i> <sup>2</sup>
doz 36 <i>per</i> <sup>2</sup>	34 <i>per</i> <sup>2</sup>
doz 38 <i>per</i> <sup>2</sup>	36 <i>per</i> <sup>2</sup>
doz 40 <i>per</i> <sup>2</sup>	38 <i>per</i> <sup>2</sup>
doz 42 <i>per</i> <sup>2</sup>	40 <i>per</i> <sup>2</sup>
doz 44 <i>per</i> <sup>2</sup>	42 <i>per</i> <sup>2</sup>
doz 46 <i>per</i> <sup>2</sup>	44 <i>per</i> <sup>2</sup>
doz 48 <i>per</i> <sup>2</sup>	46 <i>per</i> <sup>2</sup>
doz 50 <i>per</i> <sup>2</sup>	48 <i>per</i> <sup>2</sup>
doz 52 <i>per</i> <sup>2</sup>	50 <i>per</i> <sup>2</sup>
doz 54 <i>per</i> <sup>2</sup>	52 <i>per</i> <sup>2</sup>
doz 56 <i>per</i> <sup>2</sup>	54 <i>per</i> <sup>2</sup>
doz 58 <i>per</i> <sup>2</sup>	56 <i>per</i> <sup>2</sup>
doz 60 <i>per</i> <sup>2</sup>	58 <i>per</i> <sup>2</sup>
doz 62 <i>per</i> <sup>2</sup>	60 <i>per</i> <sup>2</sup>
doz 64 <i>per</i> <sup>2</sup>	62 <i>per</i> <sup>2</sup>
doz 66 <i>per</i> <sup>2</sup>	64 <i>per</i> <sup>2</sup>
doz 68 <i>per</i> <sup>2</sup>	66 <i>per</i> <sup>2</sup>
doz 70 <i>per</i> <sup>2</sup>	68 <i>per</i> <sup>2</sup>
doz 72 <i>per</i> <sup>2</sup>	70 <i>per</i> <sup>2</sup>
doz 74 <i>per</i> <sup>2</sup>	72 <i>per</i> <sup>2</sup>
doz 76 <i>per</i> <sup>2</sup>	74 <i>per</i> <sup>2</sup>
doz 78 <i>per</i> <sup>2</sup>	76 <i>per</i> <sup>2</sup>
doz 80 <i>per</i> <sup>2</sup>	78 <i>per</i> <sup>2</sup>
doz 82 <i>per</i> <sup>2</sup>	80 <i>per</i> <sup>2</sup>
doz 84 <i>per</i> <sup>2</sup>	82 <i>per</i> <sup>2</sup>
doz 86 <i>per</i> <sup>2</sup>	84 <i>per</i> <sup>2</sup>
doz 88 <i>per</i> <sup>2</sup>	86 <i>per</i> <sup>2</sup>
doz 90 <i>per</i> <sup>2</sup>	88 <i>per</i> <sup>2</sup>
doz 92 <i>per</i> <sup>2</sup>	90 <i>per</i> <sup>2</sup>
doz 94 <i>per</i> <sup>2</sup>	92 <i>per</i> <sup>2</sup>
doz 96 <i>per</i> <sup>2</sup>	94 <i>per</i> <sup>2</sup>
doz 98 <i>per</i> <sup>2</sup>	96 <i>per</i> <sup>2</sup>
doz 100 <i>per</i> <sup>2</sup>	98 <i>per</i> <sup>2</sup>
doz 102 <i>per</i> <sup>2</sup>	100 <i>per</i> <sup>2</sup>
doz 104 <i>per</i> <sup>2</sup>	102 <i>per</i> <sup>2</sup>
doz 106 <i>per</i> <sup>2</sup>	104 <i>per</i> <sup>2</sup>
doz 108 <i>per</i> <sup>2</sup>	106 <i>per</i> <sup>2</sup>
doz 110 <i>per</i> <sup>2</sup>	108 <i>per</i> <sup>2</sup>
doz 112 <i>per</i> <sup>2</sup>	110 <i>per</i> <sup>2</sup>
doz 114 <i>per</i> <sup>2</sup> </td	

## PATENT RUBBER BUCKETS AND CHAIN FOR CHAIN PUMPS.



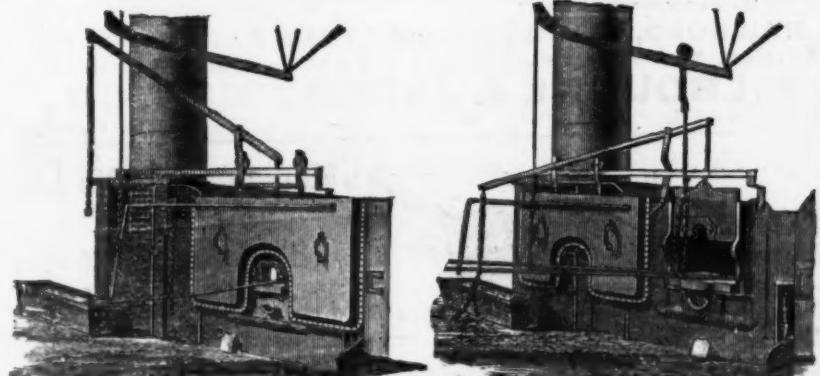
The only Perfect Expanding, Self-Draining Valve Bucket made. Our Patents cover the use of the Rubber, Nut and Bolt for Expanding, Tube and Valve for Draining. Order only the Rumsey Bucket, and avoid infringing.

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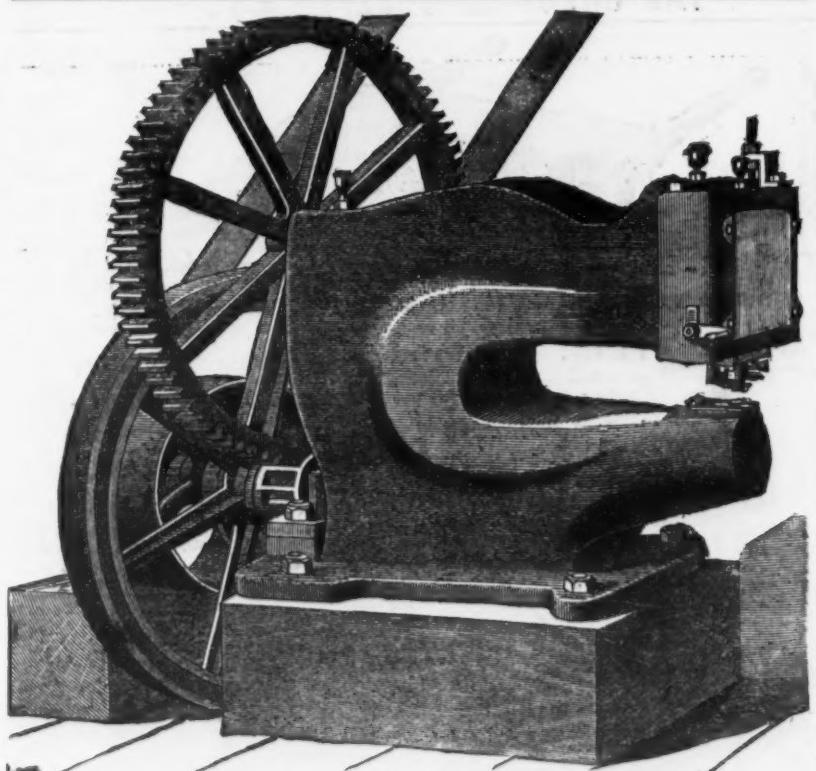
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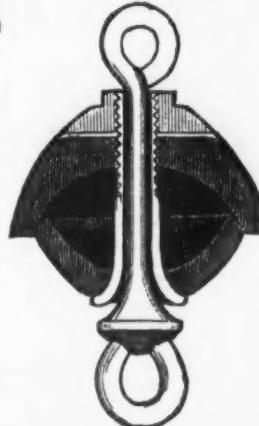
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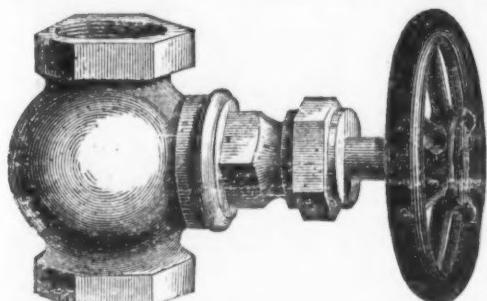
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DETROIT, MICH.

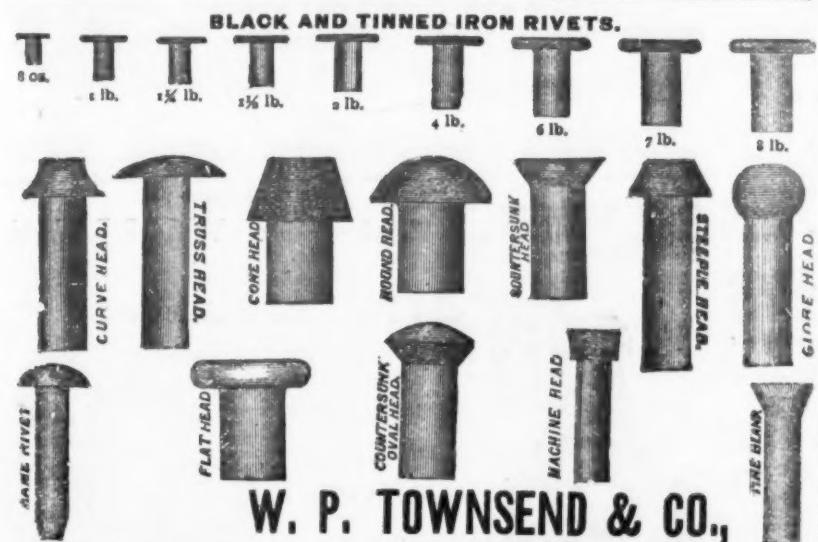
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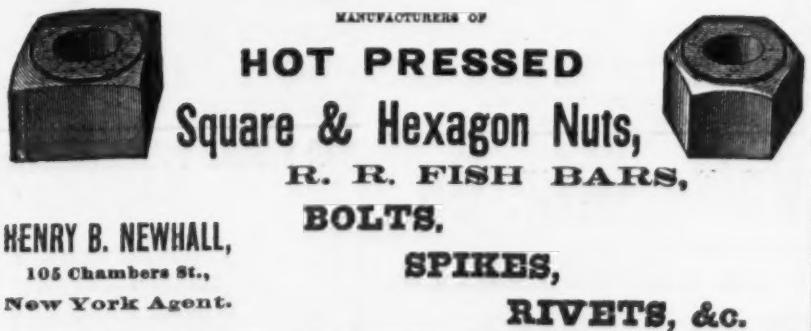
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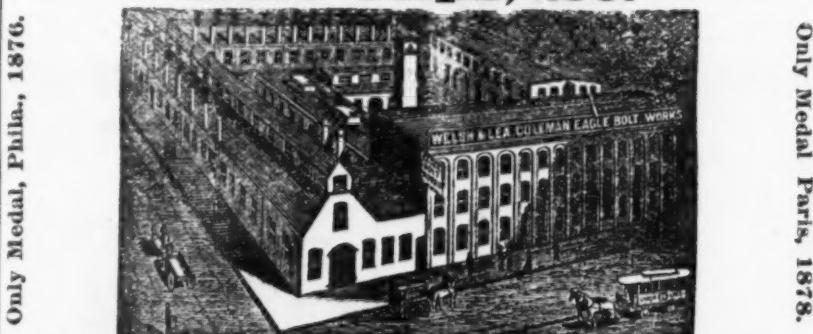
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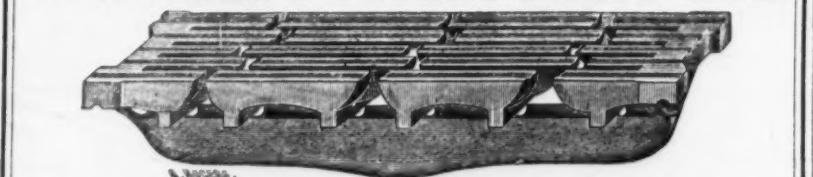
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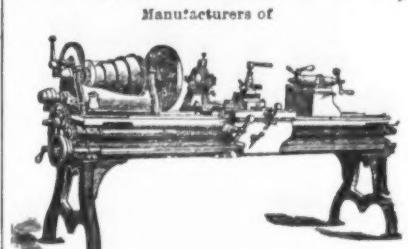
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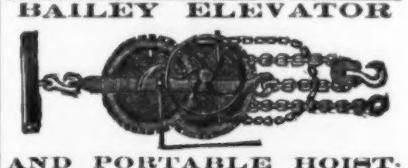
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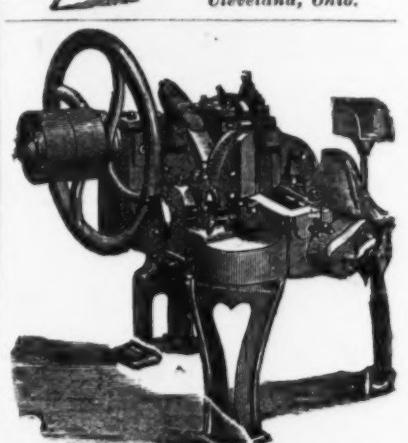


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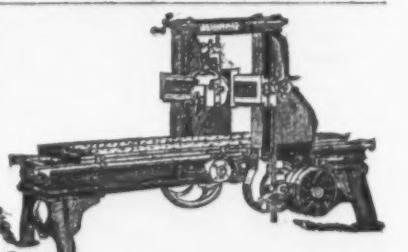


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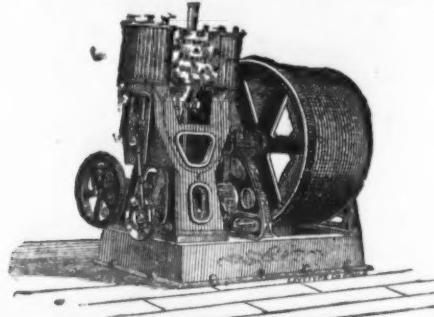
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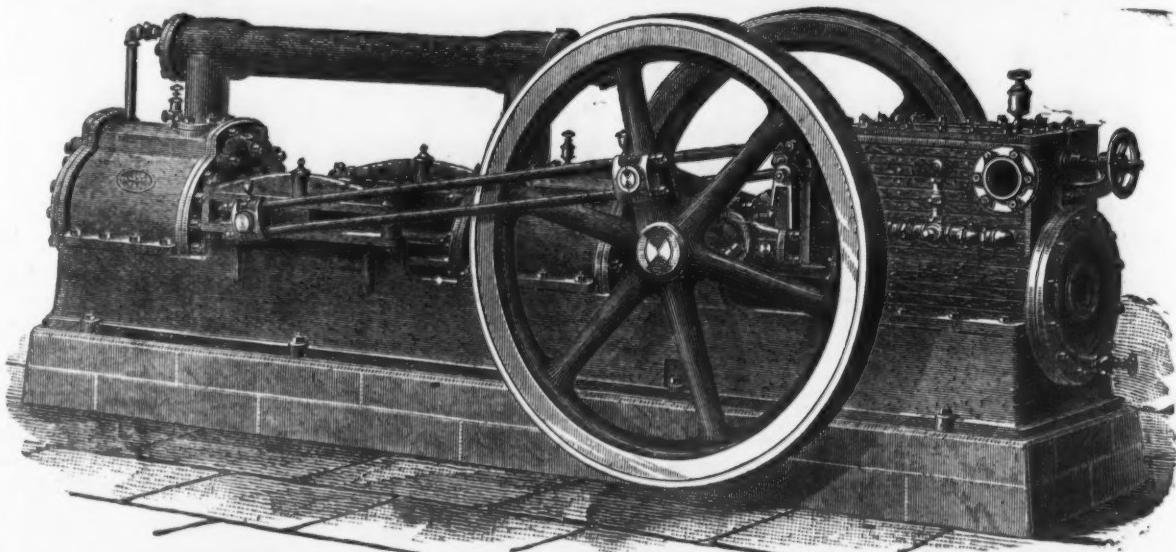
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To raise from 2 to 190 tons.  
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Second-hand Presses.  
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Send for circular of what you want.

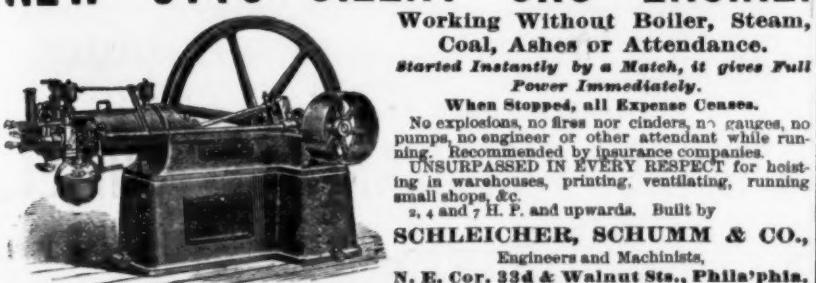


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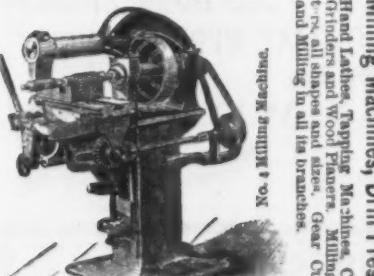
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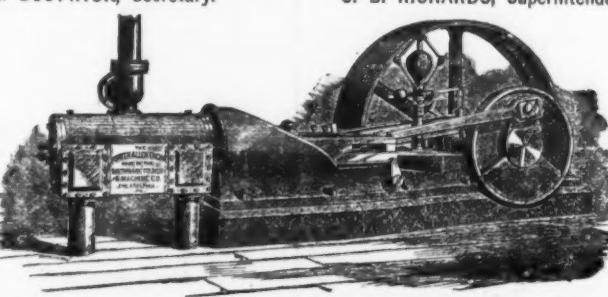
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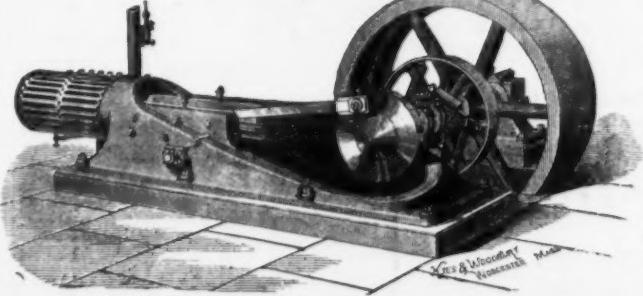
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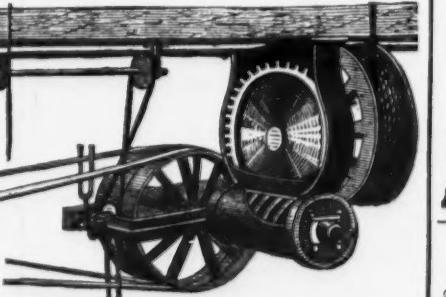
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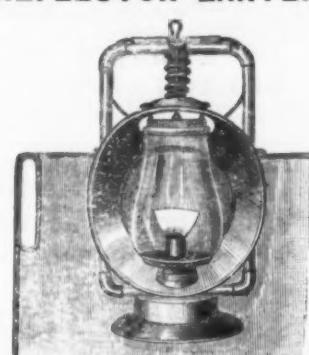
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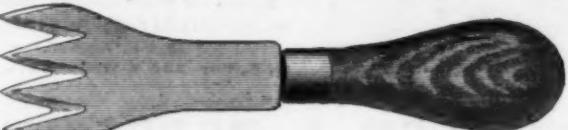
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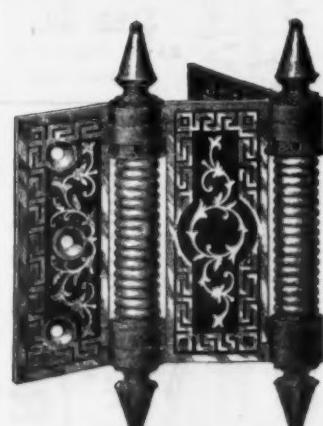
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